tshingombe fiston <tshingombefiston@gmail.com>

Research cvs build curriculum project job course module experimental
Engineering electrical master education on sited department gov and council nation and trade industrial join a

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Schneider Electric <za-quotes@schneider-electric.com> 1

Bill of Material - My configuration - 607079d9-fa26-423a-9d8c-d810df173a87 - Schneider Electric 1

Bill of Material - My configuration - 607079d9-fa26-423a-9d8c-d810df173a87 - Schneider Electric 1

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RE: My.Eaton.com Unknown Supplier Organization 1

Completed Training: Tshingombe fiston 1

Application Unsuccessful SF7479 TM Portfolio Maintenance 1

Candice C Gounden <system@successfactors.eu> 1

tshingombe fiston <tshingombefiston@gmail.com> 1

Active Job Applications 1

Inactive Job Applications 1

NRF Connect: NRF Awards Acceptance of Nomination

NRF Connect <nrfconnect@nrf.ac.za> Fri, Apr 11, 2025 at 12:15 PM
To: tshingombe tshingombe <tshingombefiston@gmail.com>

Dear Mrtshingombe tshingombe

Mrtshingombe tshingombe whom you nominated for the 2023 NRF Awards, Category:

Category of nomination: Research Excellence Award for Early Career/Emerging Researchers for application with reference number **NONF250411310281** has accepted the nomination. Kindly follow the link (https://nrfconnect.nrf.ac.za) to login to NRF Connect to complete the application.

Regards
NRF Awards Call

My CV

Career History

Instructions

• Please provide informa►on about your employment history, accomplishments, awards, and prizes, as well as any period that you were absent from research.

• Click on "Create New" to list all the positions you have held in the past , as well as your current position.

Career History Record

Accomplishments: Please include any prestigious position or positions of stature.

Awards and

prizes
Type *

Higher
Education
Sector
Sector *

saqa award degree diploma
Description *
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Disclaimer
Privacy and Website Policy
NRF ORCID Statement
NRF Connect
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36798 Electronics Engineer
11 Mar
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33883 Deputy Director: OAD
08 Jan
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06 Feb
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Rejec…
33880 Financial Controller
08 Jan

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35330 Manager: Technical Division
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07 Aug
2024
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35331 Administration Officer
09 Feb
2024

14 Feb
2024
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35337 Scientific Software Developer
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4b8137991217=System.Web.Mvc.DictionaryValueProvider%601%
Profile Completeness:
94%

1
NRF OneSuite
https://ess.nrf.ac.za/
2 of 4
4/14/2025, 11:41 AMAddress Details Work History Cover Letter Documentation Withdraw
Application
Title

Preferred Name

First Name
Second Name
Surname
Passport Number
Passport Expiry Date

Passport Issue Country

Work Permit

Date of Birth

Marital Status

Race

Gender

Disabled
Disability Type

Work Experience

Citizenship

Personal Details
Mr
fiston
fiston
tshingombe
tshingombe
TIRCOG000910610
01 January 2026
Democratic Republic of the Congo

10 November 1982
Partner
African
Male
Indicate disability...
2
Democratic Republic of the Congo
NRF OneSuite
https://ess.nrf.ac.za/
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4/14/2025, 11:41 AMQualifications
Nationality

Education Level

Certifications
Home Language

Other Language

Email Address
Drivers Licence

Home Number
Mobile Number
Recruitment Agency

Save
Engineering electrical
Spain
Diploma / Advanced Certificate / NQF 6
Engineering
English
Select Language...
tshingombefiston@gmail.com

Select Drivers Licence...
0725298946
NRF Recruitment Portal
NRF OneSuite
https://ess.nrf.ac.za/
4 of 4
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NOTAPPLICABLE - tshingombe tshingombe
1/5

Application

Title
Mr
Initials
ts
Name
tshingombe tshingombe
Email
tshingombefiston@gmail.com
ID/Passport Number
tircgog0091616
Race
African
Gender
Male
Citizenship
Non-South African citizen
Organisation
South African Qualifications Authority (SAQA)
Birth Date
10 October 1982
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14 April 2025 11:33

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Permanent appointment
Position
engineering electrical
Organisation
enginering electrical
Sector
Higher Education Sector
Is Current
Yes
Appointed From
2025-04-14
Type
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Sector
Higher Education Sector
Description
saqa award degree diploma
Type
Awards and prizes

Sector

Higher Education Sector

Description

engineering electrical science

Patents

Application Date

2025-04-14

Application Number

520520

Full Title

engineering master doctoral

Grant Date

2025-04-14

Grant Number

520520

Description

engineering rural master doctoral

Inventor

Poster

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national trade examination circulum experimental job theoretical pratical college and govern

Application Type

Continuing Application

Region

South Africa

Status

GrantedNOTAPPLICABLE - tshingombe tshingombe

3/5

Qualifications/Certifications

Academic Level of Qualification

Bachelors

Study Fields

Engineering education

Name Of Degree/Diploma (e.g. PhD)

engineering

Institution

South African Qualifications Authority (SAQA)

Fulltime

Yes

Distinction

N/A

Date of First Registration

2024-03-14

Completed

Yes

Highest Qualification

Yes

Date Obtained

2025-04-11

Academic Record/Transcript

Professional Resume_CV - Atlantic International University 2.pdf

Research Expertise

Scientific Domain

Engineering

Primary Research Fields

Engineering sciences

Technologies and applied sciences

Secondary Research Fields

Electrical Engineering

Education

Information and library science

Field Of Specialisation

African environment

Additive manufacturing

Industrial and economic sociology

Analytical Environmental Chemistry

Applied Chemistry - Membrane Technology

Nanostructured materials and packaging

Materials science and Engineering

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Structural Geology
African oral literatureNOTAPPLICABLE - tshingombe tshingombe
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0
0
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Output Title
Conservative and Semismooth Derivatives are Equivalent for Semialgebraic Maps
Title of Journal
Set-Valued and Variational Analysis
Authors

Damek Davis, Dmitriy Drusvyatskiy

Status

Published/produced

Year

2021

DOI

10.1007/s11228-021-00594-0

Output Title

master education technology rural implentation framework

ISBN Number

520-03-123456

Title of Journal

master education technology rural career thes

Volume

1900

Authors

tshingombe

Status

Attended

Publisher

atlantic

DOI

research thesist master doctoral

Refereed/Peer-reviewed Conference Outputs

Output Title

https://github.com/Kananga5/Curriculum-section-1-1.1-Thesis.-Degree-honor-council-quality-rules

low-become-justice

ISBN Number

520

Contribution Title

engineering ts

Proceeding Title

research thesis

Authors

tshingombe tshitadi

Status

Attended

Country

USANOTAPPLICABLE - tshingombe tshingombe

5/5

Student Supervision

Title

Mr

Initials

tsh

Surname

tshingombe

Citizenship Status

South African citizen

Race

African

Gender

Man

Institution

South African Qualifications Authority (SAQA)

Level

Honours

Name Of Degree/Diploma (e.g. PhD)

tshingmbe

Is Fulltime

Yes

Supervised From

2025

Supervised To

2025

Role

Supervisor

Year First Registration

2023

Is Completed

Yes

Year Awarded

2025

Personal Details

Citizenship Status

Non-South African citizen

Country

Democratic Republic of Congo

Country Of Birth

Democratic Republic of Congo

Designation

engineering

Gender

Male

Identity Number

tircgog0091616

Identity Type

Passport Number

Institution

South African Qualifications Authority (SAQA)

Institution Country

Democratic Republic of Congo

Institution Type

South Africa

Passport Expiry

23-Apr-2026 12:00:00 AM

Position

engineering

Race

African

Research Expertise

Curriculum Policy and Management

Research Expertise Type

Field of Specialisation

PSTD250411310291 - tshingombe tshingombe

1/10

Application

Call

NRF Postdoctoral Grants

Call Start Date

17 February 2025

Call End Date

15 April 2025

Reference

PSTD250411310291

Title

Mr

Initials

ts

Name

tshingombe tshingombe

Email

tshingombefiston@gmail.com

ID/Passport Number

tircgog0091616

Race

African

Gender

Male

Citizenship

Non-South African citizen

Organisation

South African Qualifications Authority (SAQA)

Birth Date

10 October 1982

Date Generated

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CV
Personal Profile
ID/Passport Number
tircgog0091616
Citizenship Status
Non-South African citizen
Country Of Birth
Democratic Republic of Congo

Current Country

Democratic Republic of Congo

Institution

South African Qualifications Authority (SAQA)

Position/Delegation

engineering

Race

African

Identity Type

Passport Number

Gender

Male

Identity Document

My CV _ NRF Connect orcide tshingombe.pdf

Institution Country

Democratic Republic of Congo

Passport Expiry

23-Apr-2026 12:00:00 AM

Research Expertise

Curriculum Policy and Management

Research Expertise Type

Field of Specialisation

Qualifications/CertificationsPSTD250411310291 - tshingombe tshingombe

3/10

Academic Level of Qualification

Bachelors

Study Fields

Engineering education

Name Of Degree/Diploma (e.g. PhD)

engineering

Institution

South African Qualifications Authority (SAQA)

Fulltime

Yes

Distinction

N/A

Date of First Registration

2024-03-14

Completed

Yes

Highest Qualification

Yes

Date Obtained

2025-04-11

Academic Record/Transcript

Professional Resume_CV - Atlantic International University 2.pdf

Career History

Type

Permanent appointment

Position

engineering electrical

Organisation

enginering electrical

Sector

Higher Education Sector

Is Current

Yes

Appointed From

2025-04-14

Type

Awards and prizes

Sector

Higher Education Sector

Description

saqa award degree diploma

Type

Awards and prizes

Sector

Higher Education Sector

Description

engineering electrical science

Research Expertise

Scientific Domain

Engineering

Primary Research FieldsPSTD250411310291 - tshingombe tshingombe

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Engineering sciences

Technologies and applied sciences

Secondary Research Fields

Electrical Engineering

Education

Information and library science

Field Of Specialisation

African environment

Additive manufacturing

Industrial and economic sociology

Analytical Environmental Chemistry

Applied Chemistry - Membrane Technology

Nanostructured materials and packaging

Materials science and Engineering

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Industry

Structural Geology

African oral literature

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2021

2020

2019

2018

2017

Total

Articles in Refereed/Peer-reviewed

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1

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1

Articles in Refereed/Peer-reviewed Journals

Output Title

Conservative and Semismooth Derivatives are Equivalent for Semialgebraic Maps

Title of Journal

Set-Valued and Variational Analysis

Authors

Damek Davis, Dmitriy Drusvyatskiy

Status

Published/produced

Year

2021

DOI

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Output Title

master education technology rural implentation framework

ISBN Number

520-03-123456

Title of Journal

master education technology rural career thesPSTD250411310291 - tshingombe tshingombe

5/10

Volume

1900

Authors

tshingombe

Status

Attended

Publisher

atlantic

DOI

research thesist master doctoral

Refereed/Peer-reviewed Conference Outputs

Output Title

https://github.com/Kananga5/Curriculum-section-1-1.1-Thesis.-Degree-honor-council-quality-rules

low-become-justice

ISBN Number

520

Contribution Title

engineering ts

Proceeding Title

research thesis

Authors

tshingombe tshitadi

Status

Attended

Country

USA

Student Supervision

Title

Mr

Initials

tsh

Surname

tshingombe

Citizenship Status

South African citizen

Race

African

Gender

Man

Institution

South African Qualifications Authority (SAQA)

Level

Honours

Name Of Degree/Diploma (e.g. PhD)

tshingmbe

Is Fulltime

Yes

Supervised From

2025

Supervised To

2025

Role

Supervisor

Year First Registration

2023

Is Completed

Yes

Year Awarded

2025

PatentsPSTD250411310291 - tshingombe tshingombe

6/10

Full Title

engineering master doctoral

Description

engineering rural master doctoral

Inventor

Poster

_____ 4.1 .12.1.Name of thesis : implementation and framework national qualification and

national trade examination circulum experimental job theoretical pratical college and govern

Application

Fellowship To Be Funded

Date Of Commencement

2025-04-10

Discipline

Engineering

Discipline Type

Default

Faculty

science engineering

Fellowship

Professional Development Programme (PDP)

Is Fulltime

Yes

Is Masters Degree Upgraded

Yes

Is Service Contract Binding

Yes

School Department

engineering doctoral

Short Description

engineering

Student Number

5200

What You Are Doing Presently

rsa on line atlatic ,saqa

Basic Information

Call Grant Year

2026

Funding Years Requested

1PSTD250411310291 - tshingombe tshingombe

7/10

Descriptive Title

Drafts Submitted Published Closed Submissions

Slides

thesis education technology ,alumni energy rural TEVET lecture under planing..Framework

qualicafication nated ncv combination irregularity back log insurance assessment policy engineering
studies Work experimental based regulation discovery Portfolio skill development rural energy low
rules
tshingombe tshitadi, tshingombe tshingombe
REJECTED
Date: 03 Mar 2025
Slides
Thesis. Degree honor, council quality rules low become justice development court and labor relations
conciliation mediation, Engineering electrical trade research policy skill ,safety security order develop
,defense order
tshingombe tshitadi
REJECTED
Date: 03 Mar 2025
Poster
_____ 4.1 .12.1.Name of thesis : implementation and framework national qualification and
national trade examination circulum experimental job theoretical pratical college and government
policy LMS in engineering studies science electrical businesses module: case studies rsa in dhet,saqa , St peace college
tshingombe tshitadi, tshingombe
REJECTED
Date: 03 Mar 2025
Article
Thesis master doctoral engineering electrical subject ciriculum framework qualicafition Education
technology
tshingombe tshitadi, tshingombe kb
REJECTED
Date: 09 Feb 2025
Article

Research education technology and research engineer electrical master degree and honour framework qualification and trade master skill low test
tshingombe tshitadi
REJECTED
Date: 24 Jan 2025
Article
1 .1.1 *Thesis: * Research policy trade theory minimum : legislation skill development : honorable
member certificate transcript outcome award
tshingombe tshitadi, tshingombekb@gmail.com tshingombekb@gmail.com, info@email.careersportal.co.za et al
Institution
CSIR - Future production: Manufacturing
Short Title
engineering rural master
Additional Information
engineering research field
Ethical ClearancePSTD250411310291 - tshingombe tshingombe
8/10
Does Project Require Ethical Clearance
Yes
Has Ethical Clearance Obtained
Yes
Additional Comments
engin
Academic record/transcript
images.png
Academic record/transcript
images.png
Details of Research
Nothing Captured
National Infrastructure Platforms
National Infrastructure Platform
CSIR – Materials Science and Manufacturing
Type of Platform

Data and equipment

Planned Usage

engineering

Science Engagement

Nothing Captured

Application Support Input

Role

Host of Research

Initials

ts

First Name

tshingombe

Surname

tshingombe

Email

tshingombefiston@gmail.com

Has Responded

Yes

Attachments

Submission Document

Eaton Classroom transcript tshingombe.pdf2.pdf

Attachment Document Type

Academic record/transcriptPSTD250411310291 - tshingombe tshingombe

9/10

Submission Document

Preview - Call for Presentations - ISC2 Security Congress 2025 tshingombe.pdf

Attachment Document Type

Acceptance letter

Submission Document

thesi project book , final engineerin tshingombe , time table allocation job cost.pdf

Attachment Document Type

Supporting Documents

Reviewer

Type Of Reviewer

Possible Reviewer

Title

Mr

Surname

tshingombe

Initials

ts

First Name

tshingombe

Email Address

tshingombefiston@gmail.com

Institution

South African Qualifications Authority (SAQA)

Specialisation

Nanostructured materials and packaging

Indicate your association, if any, with the reviewer

engineering

Indicate your reason for nominating the reviewer

engineering manufacture relate technology

Preferred Panel

Discipline

Engineering

Primary Panel

Education and Learning Research

Secondary Panel

Engineering (ENG)

Person History

Funding Organisation

NSFAS funded

Is Intern

Yes

Organisation Group

Current OrganizationPSTD250411310291 - tshingombe tshingombe

10/10

Other Sources of Funding

Funding Source Type

Research and Development Institution

Nature Of Contribution

engineering

Source

engineering

NRF Connect: Recommendation for application to the NRF

NRF Connect: NRF Awards Details of Nomination

Inbox

NRF Connect <nrfconnect@nrf.ac.za> Fri, Apr 11, 11:56 AM (4 days ago)

to me

Dear Mrtshingombe tshingombe

You have been nominated for the 2023 NRF Awards,

Category of nomination:Research Excellence Award for Early Career/Emerging Researchers by Mrtshingombe tshingombe for application with reference number NONF250411310281 Kindly follow the link (https://nrfconnect.nrf.ac.za) to login to NRF Connect; once you have logged into the system, click on the Acceptance of Nomination menu item under the My Applications heading to accept the nomination.

Regards
NRF Awards Call

...

NRF Connect <nrfconnect@nrf.ac.za> Fri, Apr 11, 11:07 AM (4 days ago)

to me

Dear tshingombe

tshingombe tshingombe has identified you to provide input for an application to the NRF. In order for the NRF to continue with the evaluation of the application, we would be most grateful if you could submit the required input for the applicant in the form of an on-line response.

Applicant: Mr tshingombe tshingombe
Email Address: tshingombefiston@gmail.com
Reference: NFSG250411310256
Institution: South African Qualifications Authority (SAQA)
Call: Black Academics Advancement Programme Post PhD Track

You have to be registered on the NRF Connect system in order to access the report form.

To register or login on the NRF Connect system, please go to
https://nrfconnect.nrf.ac.za/?applicationSupportInvitation=CfDJ8Bu2J9Atv4hMpRZaXUWIRoWP9vQLSyinkEY6AWqpuZZrHoIVr8SlH9i6IuaofoAkaTFwXej1dEOW32hknDTUcgtAd9UIi4l4zvsxCRsrDJBHn1hLID-HRs2GUk7FxjM3hg

Should the email address, used for this notification, differ from your ORCID-linked email address, please ask the applicant to change your e-mail address on the application to your ORCID-linked e-mail address. This will ensure that the reporting templates are linked to your profile. Alternatively, they may contact Supportdesk@nrf.ac.za for assistance. Refer to applicant's details above.

Once you have registered or logged in, click on "Feedback on Submission" under "Reports" on the left-hand menu.

Alternatively, please copy and paste the following URL into a web browser to complete the report:

https://nrfconnect.nrf.ac.za/?applicationSupportInvitation=CfDJ8Bu2J9Atv4hMpRZaXUWIRoWP9vQLSyinkEY6AWqpuZZrHoIVr8SlH9i6IuaofoAkaTFwXej1dEOW32hknDTUcgtAd9UIi4l4zvsxCRsrDJBHn1hLID-HRs2GUk7FxjM3hg

The report must be submitted before the deadline of 2025-04-24.

We thank you in anticipation for your assistance in this important matter.

Regards
National Research Foundation

Please do not reply to this message. Replies to this message are routed to an unmonitored mailbox.
If you have questions contact the Support Desk (Mondays to Fridays from 08h00 to 16h30) on:
E-mail: supportdesk@nrf.ac.za

NRF Connect <nrfconnect@nrf.ac.za> Fri, Apr 11, 12:02 PM (4 days ago)

to me

Dear tshingombe

tshingombe tshingombe has identified you to provide input for an application to the NRF. In order for the NRF to continue with the evaluation of the application, we would be most grateful if you could submit the required input for the applicant in the form of an on-line response.

Applicant: Mr tshingombe tshingombe
Email Address: tshingombefiston@gmail.com
Reference: NONF250411310281
Institution: South African Qualifications Authority (SAQA)
Call: NRF Awards

You have to be registered on the NRF Connect system in order to access the report form.

To register or login on the NRF Connect system, please go to
https://nrfconnect.nrf.ac.za/?applicationSupportInvitation=CfDJ8Bu2J9Atv4hMpRZaXUWIRoVcKfWzgTsfrJg73LGtr_hcrrLNxAUHGg96CfS-uMHv9-

ogUFZjFEl8_7FmWZPJ3R6oZ2PDFQoi75c1A65cndx2bvoS7MVob3hxcYnPEa_w4Q

Should the email address, used for this notification, differ from your ORCID-linked email address, please ask the applicant to change your e-mail address on the application to your ORCID-linked e-mail address. This will ensure that the reporting templates are linked to your profile. Alternatively, they may contact Supportdesk@nrf.ac.za for assistance. Refer to applicant's details above.

Once you have registered or logged in, click on "Feedback on Submission" under "Reports" on the left-hand menu.

Alternatively, please copy and paste the following URL into a web browser to complete the report:

https://nrfconnect.nrf.ac.za/?applicationSupportInvitation=CfDJ8Bu2J9Atv4hMpRZaXUWIRoVcKfWzgTsfrJg73LGtr_hcrrLNxAUHGg96CfS-uMHv9-ogUFZjFEl8_7FmWZPJ3R6oZ2PDFQoi75c1A65cndx2bvoS7MVob3hxcYnPEa_w4Q

The report must be submitted before the deadline of 2025-04-23.

NRF Connect <nrfconnect@nrf.ac.za> Fri, Apr 11, 12:45 PM (4 days ago)

to me

Dear tshingombe

tshingombe tshingombe has identified you to provide input for an application to the NRF. In order for the NRF to continue with the evaluation of the application, we would be most grateful if you could submit the required input for the applicant in the form of an on-line response.

Applicant: Mr tshingombe tshingombe
Email Address: tshingombefiston@gmail.com
Reference: PSTD250411310291
Institution: South African Qualifications Authority (SAQA)

Call: NRF Postdoctoral Grants

You have to be registered on the NRF Connect system in order to access the report form.

To register or login on the NRF Connect system, please go to https://nrfconnect.nrf.ac.za/?applicationSupportInvitation=CfDJ8Bu2J9Atv4hMpRZaXUWIRoXeFyXIfn3V7D7z3towlCTilPYg2MOL1Ry42LrPDEW4D64Rjq37pjP87S7ZF_4afLNMNmQrpkRN9FEhGXa3kv5esOVsO_fl6oPt1BOhDFKsxw

Should the email address, used for this notification, differ from your ORCID-linked email address, please ask the applicant to change your e-mail address on the application to your ORCID-linked e-mail address. This will ensure that the reporting templates are linked to your profile. Alternatively, they may contact Supportdesk@nrf.ac.za for assistance. Refer to applicant's details above.

Once you have registered or logged in, click on "Feedback on Submission" under "Reports" on the left-hand menu.

Alternatively, please copy and paste the following URL into a web browser to complete the report:

https://nrfconnect.nrf.ac.za/?applicationSupportInvitation=CfDJ8Bu2J9Atv4hMpRZaXUWIRoXeFyXIfn3V7D7z3towlCTilPYg2MOL1Ry42LrPDEW4D64Rjq37pjP87S7ZF_4afLNMNmQrpkRN9FEhGXa3kv5esOVsO_fl6oPt1BOhDFKsxw

Gmail

tshingombe fiston <tshingombefiston@gmail.com>

Activate Account for Tshingombe Fiston

---

tshingombe fiston <tshingombefiston@gmail.com> Sat, Sep 23, 2023 at 10:35 AM

To: Central Supplier Database System <csd.info@csd.gov.za>, Tenders@dhet.gov.za,

tenders@saqa.co.za, sarsdebtmanagement2@sars.gov.za, csd@treasury.gov.za, contactus@sars.gov.za, contactus@thedtic.gov.za, centraloffice@qcto.org.za, bee-complaints@beecommission.gov.za, coopscontact@cipc.co.za, companydocs@cipc.co.za

R0169241870

Activate Account for Tshingombe Fiston

Inbox

csd.info@csd.gov.za **Unsubscribe** Fri, Sep 22, 10:12 PM (10 hours ago)

to me

Dear Tshingombe Fiston

Thank you for creating a CSD user account as the first part of your registration.

Please click on the activation link below to activate your account. The link in the email will direct you to the account activation screen.

Activate Account

https://secure.csd.gov.za/Account/ActivateAccount?U=6466af5d-eb6f-4b07-bd3d-021a2de411bb&T=1406664b-3084-4c6e-9ebe-9a457ae25079

You can request a new activation link from the login page should the current link have expired. Navigate to CSD System > Log In > Resend account activation email.

DISCLAIMER: This email and its contents are subject to our email legal notice
http://www.treasury.gov.za/Email_Disclaimer.html

If you did not intend to register on the CSD and would like to unsubscribe to CSD system gener
enable you to dis-associate yourself from a supplier or Organ of State or to delete a

Welcome, Tshingombe Fiston

Welcome to the Central Supplier Database for the South African government. Here you can maintain your supplier information to ensure accurate, up-to-date, and complete information.

The menu bar gives you access to various functions like links to other websites, reports, and help. The tiles below give you access to the most frequently used features of the system. A brief description of each tile:

- Click on Suppliers Details to add, view, or make changes to supplier information.
- Click on the Registration Summary report to obtain a summary of your supplier

reflecting verification and compliance status.

- Click on News to view the latest information, communication, help, and alerts from the CSD team.
- For suppliers, click on My RFQ to view, download RFQ supporting documents, and indicate whether they intend to respond to the RFQ or not.
- Click on My Inbox to view all communication and messages (including RFQs) from CSD.
- Click on My Orders to view order information from National and Provincial Government departments.

SUPPLIER DETAILS

manage suppliers

NEWS (317)

Latest CSD news, communication, help and alerts

REGISTRATION SUMMARY

report

My Inbox (4)

All communication and messages from CSD

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ABOUT SSL CERTIFICATES

My Inbox
Search

Is Read

Communication Type	Subject	To Address	Sent Date	Is Read	View
Email	News Feed Post - News 2023-09-22 10:19:58 PM	tshingombefiston@gmail.com	2023-09-22 22:19:58		
Email	News Feed Post - Release Notes 2023-09-22 10:16:33 PM	tshingombefiston@gmail.com	2023-09-22 22:16:33		
Email	News Feed Post - Release Notes 2023-09-22 10:16:22 PM	tshingombefiston@gmail.com	2023-09-22 22:16:22		
Email	Activate Account for Tshingombe Fiston	tshingombefiston@gmail.com	2023-09-22 22:12:49		

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ABOUT SSL CERTIFICATES

My Inbox - View

Communication Type

Email

Sent Date

2023-09-22 22:19:58

To Address

tshingombefiston@gmail.com

Subject

News Feed Post - News 2023-09-22 10:19:58 PM

Message

Dear Tshingombe Fiston

To view more information about the news feed post please use the link below.

https://secure.csd.gov.za//NewsFeed/UserNewsFeedDetails/250

Regards,
CSD Team

DISCLAIMER: This email and its contents are subject to our email legal notice which can be viewed at http://www.treasury.gov.za/Email_Disclaimer.html

If you did not intend to register on the CSD and would like to unsubscribe to CSD system generated emails, click on unsubscribe which will enable you to dis-associate yourself from a supplier or Organ of State or to delete a supplier master from the CSD.

Copyright 2015 Government of South Africa.

Supplier Details

Supplier application reference nr	Supplier number	Unique registration reference nr	Legal name	Trading name	Identification type	Identification number	Edit	View	Remove
R0169241870	N/A		Tshingombe	Tshingombe	International Securities Identification Number (ISIN)	520			
R0169242840	N/A		Tshingombe	Tshingombe	Foreign Company Registration Number	520			

K

PART A
INVITATION TO BID

ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE (*NAME OF MUNICIPALITY/ MUNI*
Y)

BER:	R0169241870	CLOSING DATE:	2023/09/2	CLOSING TIME:	1
RIPTION					

UCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (MBD7

ESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX
TED AT *(STREET ADDRESS*

.03 percy street rockview flet

IER INFORMATION

OF BIDDER	Tshingombe tshitadi			
AL ADDRESS	103 percy street			
T ADDRESS	103 percy stree jhb			
HONE NUMBER	CODE		NUMBER	07876753
HONE NUMBER	072598946			
MILE NUMBER	CODE		NUMBER	
L ADDRESS	Tshingombefiston@GMAIL.COM			
EGISTRATION NUMBER	N/A			
OMPLIANCE STATUS	TCS PIN:		OR	CSD No:

OU THE ACCREDITED SENTATIVE IN SOUTH A FOR THE GOODS ICES OFFERED?	YYes No [IF YES ENCLOSE PROOF]	*ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES OFFERED?*	YYes N [IF YES, ANSWE PART B

. NUMBER OF ITEMS ED	20	TOTAL BID PRICE	R10000
TURE OF BIDDER	……TSHINGO……	DATE	
CITY UNDER WHICH ID IS SIGNED			

NG PROCEDURE ENQUIRIES MAY BE DIRECTED TO:		TECHNICAL INFORMATION MA DIRECTED TO:	
RTMENT	EDUCATION	CONTACT PERSON	EDUCAT
ACT PERSON	072598946	TELEPHONE NUMBER	072598
HONE NUMBER	EDUCATION	FACSIMILE NUMBER	
MILE NUMBER	072598946	E-MAIL ADDRESS	
L ADDRESS	TSHINGOMBEFISTON@GMAIL.COM		
	072598946		

PART B

TERMS AND CONDITIONS FOR BIDDING

1. BID SUBMISSION:
1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION. 1.2. ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED (NOT TO BE RE-TYPED) OR ONLINE 1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT AND THE PREFERENTIAL PROCUREMENT REGULATIONS THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.
2. TAX COMPLIANCE REQUIREMENTS

2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.

2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VIEW THE TAXPAYER'S PROFILE AND TAX STATUS.

2.3 APPLICATION FOR THE TAX COMPLIANCE STATUS (TCS) CERTIFICATE OR PIN MAY ALSO BE MADE VIA E-FILING. IN ORDER TO USE THIS PROVISION, TAXPAYERS WILL NEED TO REGISTER WITH SARS AS E-FILERS THROUGH THE WEBSITE WWW.SARS.GOV.ZA.

2.4 FOREIGN SUPPLIERS MUST COMPLETE THE PRE-AWARD QUESTIONNAIRE IN PART B:3.

2.5 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.

2.6 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.

2.7 WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.

3. QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS

3.1. IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)? y YES NO

3.2. DOES THE ENTITY HAVE A BRANCH IN THE RSA? y YES NO

3.3. DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA? Y YES NO

3.4. DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA? Y YES NO

3.5. IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION? Y YES NO

IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 ABOVE.

NB: FAILURE TO PROVIDE ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.

NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE.

SIGNATURE OF BIDDER: ……TSHINGOMBE TSHITADI……

CAPACITY UNDER WHICH THIS BID IS SIGNED: ……STUDENT…LEARNER……

DATE:

SBD 9

CERTIFICATE OF INDEPENDENT BID DETERMINATION

1 This Standard Bidding Document (SBD) must form part of all bids[1] invited.

2 Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or bid rigging).[2] Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.

3 Treasury Regulation 16A9 prescribes that accounting officers and accounting authorities must take all reasonable steps to prevent abuse of the supply chain management system and authorizes accounting officers and accounting authorities to:

a. disregard the bid of any bidder if that bidder, or any of its directors have abused the institution's supply chain management system and or committed fraud or any other improper conduct in relation to such system.

b. cancel a contract awarded to a supplier of goods and services if the supplier committed any corrupt or fraudulent act during the bidding process or the execution of that contract.

4 This SBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.

5 In order to give effect to the above, the attached Certificate of Bid Determination (SBD 9) must be completed and submitted with the bid:

[1] Includes price quotations, advertised competitive bids, limited bids and proposals.

[2] Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

SBD 9

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

_____

R0169241870_____

(Bid Number and Description)

in response to the invitation for the bid made by:

_____TSHINGOMBE TSHITADI / ST PEACE COLLEGE

/_____

(Name of Institution)

do hereby make the following statements that I certify to be true and complete in every respect:

I certify, on behalf of:_____TSHINGOMBE

TSHITADI_____that:

(Name of Bidder)

1. I have read and I understand the contents of this Certificate;

2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;

3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;

4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign the bid, on behalf of the bidder;

5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:

(a) has been requested to submit a bid in response to this bid invitation;

(b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and

(c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder

SBD 9

6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium[3] will not be construed as collusive bidding.

7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

(a) prices;

(b) geographical area where product or service will be rendered (market allocation)

(c) methods, factors or formulas used to calculate prices;

(d) the intention or decision to submit or not to submit, a bid;

(e) the submission of a bid which does not meet the specifications and conditions of the bid; or

(f) bidding with the intention not to win the bid.

8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.

9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.

[3] Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

SBD 9

10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

……TSHINGOMBE …… ……

Signature Date

……LEARNER / STUDENT ……/

2023 /09/2…… ……

Position Name of Bidder

SBD 8

DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

1 This Standard Bidding Document must form part of all bids invited.

2 It serves as a declaration to be used by institutions in ensuring that

when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.

3 The bid of any bidder may be disregarded if that bidder, or any of its directors have-

a. abused the institution's supply chain management system;

b. committed fraud or any other improper conduct in relation to such system; or

c. failed to perform on any previous contract.

4 In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

Item	Question	Yes	No
4.1	Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? **(Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/Authority of the institution that imposed the restriction after the *audi alteram partem* rule was applied).** The Database of Restricted Suppliers now resides on the National Treasury's website(www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page.	Yes Y	No
4.1.1	If so, furnish particulars:		
4.2	Is the bidder or any of its directors listed on the Register for Tender	Yes	No

	Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? **The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.**	Y	
4.2.1	If so, furnish particulars:		
4.3	Was the bidder or any of its directors convicted by a court of law (including a court outside of the Republic of South Africa) for fraud or corruption during the past five years?	Yes Y	No
4.3.1	If so, furnish particulars:		
4.4	Was any contract between the bidder and any organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes Y	No
4.4.1	If so, furnish particulars:		

SBD 8

CERTIFICATION

I, THE UNDERSIGNED (FULL NAME)…TSHINGOMBE TSHITADI……

CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS TRUE AND CORRECT.

I ACCEPT THAT, IN addition TO CANCELLATION OF A CONTRACT, ACTION MAY BE TAKEN AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

TSHINGOMBE…….. …….

Signature Date

……LEARNER TSHINGOMBE / 2023 /09/20…… ……..

Position Name of Bidder

Js365bW

Js914w 2

2023/09/12……..

On Sat, Sep 23, 2023 at 9:18 AM tshingombe fiston <tshingombefiston@gmail.com> wrote:

Activate Account for Tshingombe Fiston

Inbox

csd.info@csd.gov.za Unsubscribe Fri, Sep 22, 10:12 PM (10 hours ago)

to me

Dear Tshingombe Fiston

Thank you for creating a CSD user account as the first part of your registration.

Please click on the activation link below to activate your account. The link in the email will direct you to the account activation screen.

Activate Account

https://secure.csd.gov.za/Account/ActivateAccount?U=6466af5d-eb6f-4b07-bd3d-021a2de411bb&T=1406664b-3084-4c6e-9ebe-9a457ae25079

You can request a new activation link from the login page should the current link have expired. Navigate to CSD System > Log In > Resend account activation email.

DISCLAIMER: This email and its contents are subject to our email legal notice
http://www.treasury.gov.za/Email_Disclaimer.html

If you did not intend to register on the CSD and would like to unsubscribe to CSD system gener
enable you to dis-associate yourself from a supplier or Organ of State or to delete a

Welcome, Tshingombe Fiston

Welcome to the Central Supplier Database for the South African government. Here you can maintain your supplier information to ensure accurate, up-to-date, and complete information.

The menu bar gives you access to various functions like links to other websites, reports, and help. The tiles below give you access to the most frequently used features of the system. A brief description of each tile:

- Click on Suppliers Details to add, view, or make changes to supplier information.
- Click on the Registration Summary report to obtain a summary of your supplier reflecting verification and compliance status.
- Click on News to view the latest information, communication, help, and alerts from the CSD team.
- For suppliers, click on My RFQ to view, download RFQ supporting documents, and indicate whether they intend to respond to the RFQ or not.
- Click on My Inbox to view all communication and messages (including RFQs) from CSD.
- Click on My Orders to view order information from National and Provincial Government departments.

SUPPLIER DETAILS

manage suppliers

NEWS (317)

Latest CSD news, communication, help and alerts

REGISTRATION SUMMARY

report

My Inbox (4)

All communication and messages from CSD

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ABOUT SSL CERTIFICATES

My Inbox

Search

Is Read

Communication Type	Subject	To Address	Sent Date	Is Read	View
Email	News Feed Post - News 2023-09-22 10:19:58 PM	tshingombefiston@gmail.com	2023-09-22 22:19:58		
Email	News Feed Post - Release Notes 2023-09-22 10:16:33 PM	tshingombefiston@gmail.com	2023-09-22 22:16:33		
Email	News Feed Post - Release Notes 2023-09-22 10:16:22 PM	tshingombefiston@gmail.com	2023-09-22 22:16:22		

Email	Activate Account for Tshingombe Fiston	tshingombefiston@gmail.com	2023-09-22 22:12:49

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ABOUT SSL CERTIFICATES

My Inbox - View

Communication Type

Email

Sent Date

2023-09-22 22:19:58

To Address

tshingombefiston@gmail.com

Subject

News Feed Post - News 2023-09-22 10:19:58 PM

Message

Dear Tshingombe Fiston

To view more information about the news feed post please use the link below.

https://secure.csd.gov.za//NewsFeed/UserNewsFeedDetails/250

Regards,
CSD Team

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If you did not intend to register on the CSD and would like to unsubscribe to CSD system generated emails, click on unsubscribe which will enable you to dis-associate yourself from a supplier or Organ of State or to delete a supplier master from the CSD.

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Supplier Details

Supplier application reference nr	Supplier number	Unique registration reference nr	Legal name	Trading name	Identification type	Identification number	Edit	View	Remove
R0169241870	N/A		Tshingombe	Tshingombe	International Securities Identificati	520			

				on Number (ISIN)	
R0169242840	N/A	Tshingombe	Tshingombe	Foreign Company Registration Number	520

K

On Fri, Sep 22, 2023 at 10:12 PM <csd.info@csd.gov.za> wrote:

Dear Tshingombe Fiston

Thank you for creating a CSD user account as the first part of your registration.

Please click on the activation link below to activate your account. The link in the email will direct you to the account activation screen.

Activate Account

https://secure.csd.gov.za/Account/ActivateAccount?U=6466af5d-eb6f-4b07-bd3d-021a2de411bb&T=1406664b-3084-4c6e-9ebe-9a457ae25079

You can request a new activation link from the login page should the current link have expired. Navigate to CSD System > Log In > Resend account activation email.

national treasury

Department:
National Treasury
REPUBLIC OF SOUTH AFRICA

FC
Ce

eM

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If you did not intend to register on the CSD and would like to unsubscribe to CSD system generated emails, click on unsubscribe which will enable you to dis-associate yourself from a supplier or Organ of State or to delete a supplier master from the CSD.

9 attachments

REVISED MBD 7.1.docx
38K View as HTML Scan and download

REVISED MBD 1.doc

Supplies bidden tendered ,

This is to confirm that an incident was logged On: 2025/04/15 7:57:50 AM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za 7:58 AM (2 hours ago)

to me

Dear Tshingombe Fiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**2164594**
Summary:	Re: city powervisited tender
Customer Name:	Tshingombe Fiston
Location:	
Priority:	3
Status:	Logged
Category:	

Description

Important: This email originated from an external sender. Please do not click on email links or open attachments you did not expect. When in doubt, please contact the ICT Service Desk.

On Wed, Jan 3, 2024, 11:11 tshingombe fiston > wrote:
[X][X]

RESEARCH AND DEVELOPMENT (R & D) TAX INCENTIVE
NOTIFICATION OF CHANGES REPORT

The purpose of this form is to indicate any material change(s) made to any ongoing project/

programme / technological area that has been approved in terms of the amended Section 11D of the Income Tax Act, 1962, (Act No.58 of 1962). It is a requirement of the Act that such changes must be reported.

This form must be completed in full and submitted to Department of Science and Technology using one of the following methods:

• Hand or courier to Building 53, Scientia Campus, Meiring Naudé Drive, Brummeria;{After hours use the drop box at the DST entrance}; or
• Registered mail to:
Private Sector R&D Activities Unit, Department of Science and Technology
PostNet Suite 133
Private Bag X844
Silverton
0127

Enquires can be directed to tax@dst.gov.za, or send a fax to 086 685 9528, or phone 012 843 6829.

PART 1 – PARTCULARS OF THE COMPANY

101
Name of the Company
Tshingombe tshitadi engineering

102
Tax reference number
9
7
2
2
3
2
8
2
3
8

103
Tax Year
2
0
23

PART 2: PARTCULARS OF CHANGES IN THE PROJECT/ PROGRAMME / TECHNOLOGICAL AREA

201

Project, Programme or
Technological Area Name

202

Application Reference Number
203
Project, Programme, Technological Area current status

(In-progress , suspended, discontinued)

204
Status Effective date

Engineering electrical
520
Cvs portofolio
2021

PART 3: PROJECT/PROGRAMME/TECHNOLOGICAL AREA - SPECIFIC INFORMATION
For each of the projects, programmes or technological areas listed above please provide the following information (You may reproduce Part 3 in case of multiple projects)

Name of project/programme/technological area:.....
301

(a) Please indicate with an X, type of change made to the Project/ Programme/ Technological area

y

i. Objective

yx

ii. Methodology of research

iii.
yx

Funding

iv.
x

Country where some of the R&D Activities were/will be undertaken

v.
x

Other (please specify) …….

(b) Discuss any incremental change, as selected above, which occurred with respect to the research and development activities of the project/ programme/ technology area.
.....implentation engineering electrical collge frame work in job porto folio evidnce file student .....
department of science and innovation socio economic development,
-1 .programme administration technology innovation international cooperation
Gov , city power and St peace college
Programme, exposition science

-2.programme research development support :
St peace college lecture and learner development under planning. Department high Education vs saqa vs qcto,vs seta research resolved time table examination Assessment police , Portfolio documents systems integrity police academic,

-2.1. purpose: innovation practical and theoretical. science and technology science national trade factor outcome time table trading examination and qualifition framework national diploma n engineering and council trade sector authority , innovation system outcomes empower system subject entry phase learning and lecture teach science exhibition generation technology Assessment police ,and Engineering assessment trade machine and trade control system process project system control evaluation system
2.1.2 knowledge: innovation practical and theoretical trade technology electrical engineering Electrotechnolgy empower value are recreation orientation maximum, value tax , return studies and
Examine electro technology engineering time table assessment
Completed research laniaries system technology value entry lecture exam nated vs. saqa vs qcto linearism system electro technology power fundamental job duty job maximum, job value minimum trade operational, task minim component system,
-Job duty cycle system value : learner lecture framework qualifition and occupation trade job value salary resource human maximum fiscality minimum technology components system : sciences natural system investigation design minimum agreement value job trade module,task minimum ,task minimum service require trading sectors and maximum sectoral electrotechnology trading components

Value financial tax system:
2.2.3: strategies: strategies phasing module tasking curriculum system implantation levels grading lecture
objectivity:
The trading lecture and learning system engineering science electrical subject and technology electrical ,electro technology ,education technology
System outcome , trading education technology systems power factor demand system education , efficiency system assignment power objectivity module task , maximize inventories psychopedagogie metric system month week of observations learner form test assessment assignment control tpm maintence meeting product control technology goal .

-1.2.3.4: development humain generation: system teaches sector organisations technology rate value maximum rate demand factor admnise value ask required report system value.
-1.2.5.component: trading lecture used company manufacture relate system Industrial Education system intelligence management system information ,education computing control system switch and material support command disposition component manufacturers Numerical time table framework regulatory Education trade relate handbook guideline information and orientation integrative system component handbook relate maintenance update , upgrade system
-1.2.6: basic science infrastructure: implantation of research innovation mission equipment College equipment framework theory practical lab workshop workplace implantation department gov system ,more

Inovation,tax incentives,,
Meeting request

-National energie regulatory of South Africa mandatory electricity piped , invitation me minister tribunal,,

Meeting electrical conformance board design installer regulatority Cox competition b

Meeting salt .dmrg stick ,sale revenue power plant fuel used national treasure sars department of energy mandatory ensure private sector participr in power generation ,
Meet national skill fund,, national research fund ,,
Visa permit
[X]
[X]

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(c) What challenges were encountered that led to changes indicated above in the R&D project that was previously approved by the Department of Science and Technology?

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department of science and innovation socio economic development,
-1 .programme administration technology innovation international cooperation
Gov , city power and St peace college
Programme, exposition science

-2.programme research development support :
St peace college lecture and learner development under planning. Department high Education vs saqa vs qcto,vs seta research resolved time table examination Assessment police , Portfolio documents systems integrity police academic,

-2.1. purpose: innovation practical and theoretical. science and technology science national trade factor outcome time table trading examination and qualifition framework national diploma n engineering and council trade sector authority , innovation system outcomes empower system subject entry phase learning and lecture teach science exhibition generation technology Assessment police ,and Engineering assessment trade machine and trade control system process project system control evaluation system
2.1.2 knowledge: innovation practical and theoretical trade technology electrical engineering Electrotechnolgy empower value are recreation orientation maximum, value tax , return studies and
Examine electro technology engineering time table assessment
Completed research laniaries system technology value entry lecture exam nated vs. saqa vs qcto linearism system electro technology power fundamental job duty job maximum, job value minimum trade operational, task minim component system,
-Job duty cycle system value : learner lecture framework qualifition and occupation trade job value salary resource human maximum fiscality minimum technology components system : sciences natural system investigation design minimum agreement value job trade module,task minimum ,task minimum service require trading sectors and maximum sectoral electrotechnology trading components
Value financial tax system:
2.2.3: strategies: strategies phasing module tasking curriculum system implantation levels grading lecture
objectivity:
The trading lecture and learning system engineering science electrical subject and technology

electrical ,electro technology ,education technology
System outcome , trading education technology systems power factor demand system education , efficiency system assignment power objectivity module task , maximize inventories psychopedagogie metric system month week of observations learner form test assessment assignment control tpm maintence meeting product control technology goal .

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-1.2.5.component: trading lecture used company manufacture relate system Industrial Education system intelligence management system information ,education computing control system switch and material support command disposition component manufacturers Numerical time table framework regulatory Education trade relate handbook guideline information and orientation integrative system component handbook relate maintenance update , upgrade system
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Inovation,tax incentives,,
Meeting request

-National energie regulatory of South Africa mandatory electricity piped , invitation me minister tribunal,,

Meeting electrical conformance board design installer regulatority Cox competition b

Meeting salt .dmrg stick ,sale revenue power plant fuel used national treasure sars department of energy mandatory ensure private sector participr in power generation ,
Meet national skill fund,, national research fund ,,
Visa permit
[X]
[X]

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National Treasury EMail Disclaimer

For inquiries refer to case **Incident # 2164594** as your reference number

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Regards

CSD Contact Centre
+27(0)12 406 9222

This is to confirm that an incident was logged On: 2023/06/18 2:23:06 PM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za Sun, Jun 18, 2:23 PM

to me

Dear tshingombefiston tshingombefiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**1514125**
Summary:	Re: career mentoring engineering
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	3
Status:	Logged
Category:	

Description

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On Sat, May 6, 2023 at 1:21 PM tshingombe fiston > wrote:

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Regards

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+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

This is to confirm that an incident was logged On: 2023/06/18 2:27:16 PM (UTC 02:00) - Africa/Johannesburg

Inbox

csd@treasury.gov.za Sun, Jun 18, 2:27 PM

to me

Dear tshingombefiston tshingombefiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**1514126**
Summary:	Re: N engineering qualifications test
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	3
Status:	Logged
Category:	

Description

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On Tue, Jun 13, 2023 at 7:14 PM TSHINGOMBEKB TSHITADI > wrote:
N diploma
Questions assessment,answer assessment evaluation n diplomat,
-requirement job:advance filing mastering n qualifications trade theory module.
-atom moleculesatter anything substence accupr surface industrial electronics matter atom electronics conductor insulator science engineering static material drawing material n engineeri electrotech ,electrotechnolgy ,
-question assessment completed subject :undertake material drawing subjects mathematics algebraic basically,module n1,2,3,4,5,6 trade theory electrotech low maintenance saqa n engineering electrical laball circuit , design explain low cell, electronics industry Lubrication engineering science friction dynamic material beam Brunelle,
-saqa inspection test compliance coc device protection logic controller electrotechnique inspecti care material.
-transmission long distance line from substation n ,saqa logic control loop Murray ,
-drawing electrical n saqa engineering design diagram interpretation,n1,2,3,4 installed rules second papper cable sabs sans db box PVC xpl , protection device material over load control find fault relay control . logic
Control fault , electronics dismantle, industrial electronics digital theory soldering Mattis conductor semie. Conductor Doppler molsfet molding diode.
-transition junction pn, PNP proton resistance condensator oscillacope industrial n diagnosis
-theory explain labaled in papper label in working designing woodworking timber in plant operations briclyan electronics form silicon.
-qualification n saqa phase final 1th,2th,3th,4th preliminary phase .

-undertaking material package phase n 4,6 accountability office travel information process mark
trade theory atom, operationel step .
Task atomic.
-operational theory phases preliminary operator dismantle diagnosis planing survivor organisatic
labell package sheet
Management system.
-preliminairy mark, weighting math algebra exponential power mensuration.
-qualification hand long skill occupation invention atomic material inventory operationel task
constructor
-undertaking material no meeting.
-qualification credit 360 week 24 monty18,field
Theory understaking formula packings size practical undertake material design Poe's project
metal..
-assembly requireded maintence repair atom reaction chemical physics theory engineering n
diffusion mold plastic injection electrochemical.
Theory fundamental formul.
-composition components instruction offering test material material MPA ..
Theory formula input output given solution practical experience observations material assembly
relever characteristics.
-formula premise wire Kirchoff parallel loop does interpretation drawing controls switchigears
ways design db sum theory practical experience drawing outlet plug circuit, schematic fault find
rules installation practical tools hand foot wire.
-inventor drawing reduce voltage schema discovery control parallels diagram theory transmissio
theory long distance system.
-rating knowledge application synthesis scaling qualifications.
-theory panel wiring way premise control reduce voltage transformer delta start formula.v.u.i ,z
unity ,
Impedance engineering control step voltage voltage control to key way reduce resistance paralle
load line generation diagram theory wire practice step voltage operation legend relay timer dire
load inverse load fit wire motion join connected switch test observ fund form theory pression ta
Bassin water premise practical, sawage pipe reduce pression under

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excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

This is to confirm that an incident was logged On: 2023/06/18 2:30:00 PM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za Sun, Jun 18, 2:30 PM

to me

Dear tshingombefiston tshingombefiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**1514127**
Summary:	Re: Release resultat statement and finalize award diploma./irregularilarity case .re marker
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	3
Status:	Logged
Category:	

Description

Important: This email originated from an external sender. Please do not click on email links or open attachments you did not expect. When in doubt, please contact the ICT Service Desk.

On Fri, May 12, 2023 at 8:21 AM TSHINGOMBEKB TSHITADI > wrote:
Hello dear

On Mon, 08 May 2023, 14:38 TSHINGOMBEKB TSHITADI, > wrote:
Enquiry:to national examination and assessment college principal organisation . Chief invigilator commited irregularity
-chief directorates national examination
Dhet./ And SAQA evaluation/QCTO,
Registrar /
Mr:Pdevilliers.
Application from:

Student ID: 2100002023812.
Student name.tshingombe Tshitadi
College instituts name St peace college
Exam :external shalom technical :
.899993812
:Afric policing instituts
-Memorandum :2023/0508
Requested letter reasoning for :
release finalize n diplomat studies engineering electrical
_____
Good day dear :
I'm applying to claim for your attention in your department and instituts to regarding my application
In consolidation .
Release of November examination to verify the outcome of irregularilarity observed the quality assurance bodie responsibility for TVET college qualification n diplomat engineering studies electrical engineering.
Didn't have received the letter approved release November engineering studies subject under investigation and invalid subject n3 trade electrical theory transcript registrar tick sign to day of exam n4 electrotech chief invigilator and assessment deal with 21 days of publication and consic all evidence a ailable make decisions base will notify the examination as soon it possible it finalized, candidate fail to submit additional information receipt. Statement submitted number

1980/11/10..notify 1982/11/10 N4 fail druip. Review statement n1,n2,n3,n4 statement released marking scale submitted Portofilio evidence Poe s engineering electrical time table college privat system assessment police , evidence docket documents examination reference student examination semester 4, Portofilio online send additional information system to saqa instituts foreign award meeting requireded documents completed exam dhet framework engineering electrical icass evidence based topics scaling process on line meet award certificate investigatior documents police criteria , council quality.meet Conductor asssessor saqa . engineering criteria.marking in progress documents Portofolio value assessment police and engineering cour Dhet.
We are alert your attention in department busy conducting subject investigation and envisaged that the result will be release by it responsabilite,inform that candidate release subject on line The department of labour electrical and engineering still busy finalising the mechanical of engineering examinations script plant engineering the results in certificate all effected candidate Portofilio labour expiremental icass in circulum saps seta sasseta CETA verification for trade practices panel electrical wiring.plumving in trade theory

base engineering design investigation
additional information evidence base .
Examination national irregularilarity committee n4-n6...n1-n3 appealing process ,and activity notice letter to get instituts notify candidate outcome of the meeting serious,closing date registration final submission of script letter 21days affidavit submission and final..
Ref. All affected candidate who do not received their results immediately must be registered to rerwiten subject during next examination cycle as note late entree will be accepted in Portofilio assessment topic and completed submitted additional information system and the application proof must be submitted a register must be compiled on the template provided and send to the owner.no application for remark received after close date will be deemed irregularilarity and not be processed . examination centre responsible for refunding candidate in case of application submitted ofter closing.
The according to national conduct policy the script may be destroyer 6monty after the release o the results for business month for engineering no application for remark re check of script will b accepted beyond and receive November February,2023 exam cycle,and all candidates who have pending outcome resultat and have not received the outcome are mark re-maek recheck proces must be registered for the next examination cycle no late entries will be accepted,
Code 1104126, subject electrical trade theory ,level 3 reason under investigation .the process in Portofilio evidence topics learner in saqa documents meeting requireded.
Thanks u for your attention.

National Treasury EMail Disclaimer

For inquiries refer to case **Incident # 1514127** as your reference number

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Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Friday excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

This is to confirm that an incident was logged On: 2023/06/18 2:30:59 PM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za Sun, Jun 18, 2:31 PM

to me

Dear tshingombefiston tshingombefiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**1514128**
Summary:	Re: Complaint pension fund
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	3
Status:	Logged
Category:	

Description

Important: This email originated from an external sender. Please do not click on email links or open attachments you did not expect. When in doubt, please contact the ICT Service Desk.

c

On Sun, Jun 4, 2023 at 2:02 PM TSHINGOMBEKB TSHITADI > wrote:
Complaint

On Sun, 04 Jun 2023, 08:16 TSHINGOMBEKB TSHITADI, > wrote:
Nogada guarding services vs tshingombe Tshitadi
P.o.box @0396, /
Falls 1522,fourteenth avenue,northemeadsauare office block,benoni, 1501, Ccma benonie jhb , Witbank
Telephone 2711849/19/15/33,
Facsimiles+271184984730.
V.a.t n: 4150224121.
Cc No,2005/124132/23.
P.sira no:135842
Info@nogada.co.za.
Nogada sa review employee
Edenvale
_____
Job title : customer trolley assistant parking career
, location. Witbank..Ccma labour court jhb...psira pssf
-Work life balance: R000
-pay benefits:R000
-job security advancement.
-management culture
Good condition work .day night shift .

-area management pro cons plenty,yes,no
Poor .
Non productive ,site supervisor home joined the company
Overall rating rating
Question wath are working

-cvs employers ,job ,submit
Nogada security area nagada R2000.R5Ooo month compagny base
Securite area vehicle for 3 month car allowance

Pay query.
Guard name: tshingombe Tshitadi
Position in compagny: security officer car guard number...
Guard Ccma labour outcome
Site name:savewas Witbank,,
Date: outcomes court Ccma
Time:
Vs
Service transcript
Vat arbour square cnr Juta street ground street Braamfontein 2001,
Tel:O1133912/0794335.
Mazanzi@telecom.co.
Mzanzibusi ESS.
Vat no:4190278988
Invoice 1860
Date:11/07/2020
Customer Vat.
To :Tshitadi tshingombe
Email: tshingombe kb@gmail.com
Unit 11,1, description 1-wee qwasa
Tshingombe...
Rate:R38,00 ,,amount 418,00
Admi :R250,00,,a R,2500
Parties: tshingombe t /nogada security
Case no :jr 2461/2015
Total:R668,00
15%vat R100,20

Deposit,Total due ,518,20,,
Banking detai stand , business count ,branch springs..
Bid estimate quotation,01-07-2020/ jr 2461-2015 ../ JA/2019
Bid closed:

-Labour court court order : digital
Tax statement

--Labour uif coid dol:case number
Sars : estate query attorney legal
Court order :

-Cpic : property .court order close cooperation..
Translate . termination

Beee dti

-psira pssf Court order enforcement
Complaint .

Seta Teta sasseta : skill development order grantees :

On Tue, 30 May 2023, 14:29 TSHINGOMBEKB TSHITADI, > wrote:
T.tshingombe .
Good day dear I need your assistance above of re completed complain investigation verification process.
_____
.

National Treasury EMail Disclaimer

For inquiries refer to case **Incident # 1514128** as your reference number

This is a system generated e-mail and is for confirmation purpose only.

Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Friday excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

This is to confirm that an incident was logged On: 2023/08/13 12:48:34 PM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za Sun, Aug 13, 12:48 PM

to me

Dear tshingombefiston tshingombefiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**1573950**
Summary:	Re: document walletet appointment office / posted office
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	3

Status: Logged

Category:

Description

Important: This email originated from an external sender. Please do not click on email links or open attachments you did not expect. When in doubt, please contact the ICT Service Desk.

On Sun, Aug 13, 2023 at 12:31 PM tshingombe fiston > wrote:

On Sat, Aug 12, 2023 at 11:27 AM tshingombe fiston > wrote:

National Treasury EMail Disclaimer

For inquiries refer to case **Incident # 1573950** as your reference number

This is a system generated e-mail and is for confirmation purpose only.

Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Friday excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

Automatic reply: document walletet appointment office / posted office

Inbox

K

Kelebogile Marago Sun, Aug 13, 12:48 PM

to me

Good day

Kindly note that I am out of office. For any assistance, kindly contact Ms Manganye on Abigail.Manganye@treasury.gov.za

Kind regards,

Kelebogile

National Treasury EMail Disclaimer

C

Contact Us Sun, Aug 13, 12:49 PM

to me

Dear Taxpayer

Thank you for your correspondence.

Kindly be advised that supporting documents submitted to this eMail account will no longer be

linked to your unresolved case number.

Taxpayers are reminded to submit supporting documents using SARS eFiling or via the corporate website On Line Service at SARS Online Query System

For assistance on how to use this service, kindly navigate to our guide at GEN-GEN-51-G01 – SARS Online Query System – External Guide or watch our video on How to Submit Supporting Documents to SARS Online - YouTube

As this is an auto response eMail, please do not reply and thank you for your co-operation.

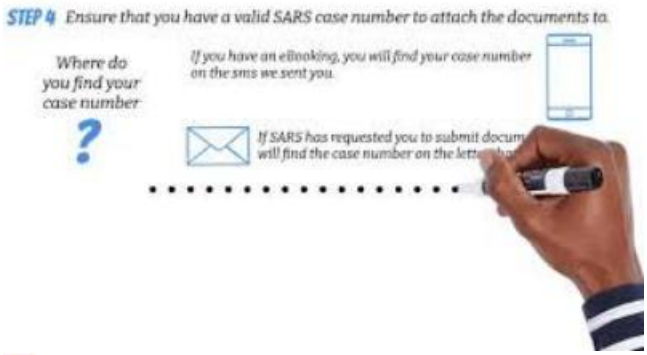
Sincerely,

#Your Tax Matters!

South African Revenue Service (SARS)

Disclaimer
Please Note: This email and its contents are subject to our email legal notice which can be viewed at https://www.sars.gov.za/terms-and-conditions/email-disclaimer/

Attachments area
Preview YouTube video How to Submit Supporting Documents to SARS Online



This is to confirm that an incident was logged On: 2023/08/13 12:52:02 PM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za Sun, Aug 13, 12:52 PM

to me

Dear tshingombefiston tshingombefiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	1573951
Summary:	Re: Visited work engineering electrical in city power training/visited observations working student Portofilio
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	3
Status:	Logged

Category:

Description

Important: This email originated from an external sender. Please do not click on email links or open attachments you did not expect. When in doubt, please contact the ICT Service Desk.

On Thu, May 25, 2023 at 8:17 AM TSHINGOMBEKB TSHITADI > wrote:
Hello dear traine training center internership apprenticeship student
We are on assessment time table engineering electrical,need your assistance and attention for more information about the city power plant work ,

National Treasury EMail Disclaimer

For inquiries refer to case **Incident # 1573951** as your reference number

This is a system generated e-mail and is for confirmation purpose only.

Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Friday excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

t

Inquiry to CSD

Inbox

CS

csd@treasury.gov.za Mon, Aug 14, 10:03 AM (13 days ago)

to me

Good day Sir / Madam

We kindly advise that the email address csd@treasury.gov.za is reserved for CSD supplier support queries.

For city power plant queries, we kindly advise you to contact the relevant department in order to assist you further.

Our service is also available telephonically on 012 406 9222 and operates from Monday to Friday, excluding public holidays from 08:00am to 16:30pm

Regards
Thenjiwe

Customer Service Representative
CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://www.csd.gov.za

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National Treasury EMail Disclaimer

Thank you for your assistance.
Thank you for your response.
Thank you for the feedback.

Incident logged on 2023/08/13 12:52:02 PM (UTC 02:00) - Africa/Johannesburg; was resolved on 2023/08/14 10:02:39 AM (UTC 02:00) - Africa/Johannesburg

Inbox

csd@treasury.gov.za Mon, Aug 14, 10:03 AM (13 days ago)

to me

Dear tshingombefiston tshingombefiston,

We are committed to providing you with an EXCELLENT CUSTOMER SERVICE experience. We would like your feedback about the manner in which we handled your query/request.
Click here to fill out survey

Incident# 1573951 has been resolved:

Resolution
Kindly refer to the email send from csd@treasury.gov.za

Incident #	**1573951**
Summary:	Re: Visited work engineering electrical in c observations working student Portofilio
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	5

Status:	Resolved
Category:	Bid Contact Enquiry
Resolved On:	2023/08/14 10:02:39 AM (UTC 02:00) - Af

Description

On Thu, May 25, 2023 at 8:17 AM TSHINGOMBEKB TSHITADI > wrote:
Hello dear traine training center internership apprenticeship student
We are on assessment time table engineering electrical,need your assistance and attention for r
city power plant work ,

National Treasury EMail Disclaimer

For inquiries refer to case **Incident # 1573951** as your reference number
This is a system generated e-mail and is for confirmation purpose only.
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Regards

CSD Contact Centre
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csd@treasury.gov.za
https://secure.csd.gov.za/

t

Incident logged on 2023/08/13 12:48:34 PM (UTC 02:00) - Africa/Johannesburg; was resolved on 2023/08/14 10:03:21 AM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za Mon, Aug 14, 10:04 AM (13 days ago)

to me

Dear tshingombefiston tshingombefiston,

We are committed to providing you with an EXCELLENT CUSTOMER SERVICE experience. We would like your feedback about the manner in which we handled your query/request.
Click here to fill out survey

Incident# 1573950 has been resolved:

Resolution	
Resolved according to Incident: 1573927 (Resolved)	

Incident #	**1573950**
Summary:	Bid Contact Enquiry
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	5
Status:	Resolved
Category:	Bid Contact Enquiry
Resolved On:	2023/08/14 10:03:21 AM (UTC 02:00) - Af

Description
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On Sun, Aug 13, 2023 at 12:31 PM tshingombe fiston > wrote:

On Sat, Aug 12, 2023 at 11:27 AM tshingombe fiston > wrote:

National Treasury EMail Disclaimer

For inquiries refer to case **Incident # 1573950** as your reference number
This is a system generated e-mail and is for confirmation purpose only.
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Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

This is to confirm that an incident was logged On: 2023/08/19 12:13:28 PM (UTC 02:00) - Africa/Johannesburg

Inbox

csd@treasury.gov.za Sat, Aug 19, 12:13 PM (8 days ago)

to me

Dear tshingombefiston tshingombefiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**1579970**
Summary:	Re: Release resultat statement and finalize award diploma./irregularilarity case .re marker
Customer Name:	tshingombefiston tshingombefiston
Location:	

Priority:	3
Status:	Logged
Category:	

Description

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Electrical Trade Theory
Lecturer Guide
ELECTRICAL TRADE THEORY
Tommy Ferreira, Trevor Adams
& Jan Randewijk
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N2 Electrical Trade Theory Lecturer Guide v
Lecturer guidance
1. General aims
####### e general aims of this course is to equip students with relevant theoretical
####### knowledge to enable them to integrate meaningfully into:

* an electrical apprenticeship;
* an electrical learnership;
* an electrical contracting environment; or
* a power utility environment.

2. Speci c aims

####### Students should acquire in-depth knowledge of the following subject outcomes:

* Alternating current circuit theory
* Conductors, insulators and cables
* Electrical reticulation
* Switchgear and protective devices
* Batteries
* Direct current machines
* Alternating current machines
* Transformers
* Earthing
* Measuring instruments
* Renewable energy.

3. Prerequisite

####### Students must have passed N1 Electrical Trade eory.

4. Duration

####### e duration of this course is one trimester full-time or part-time.

5. Evaluation

####### 5 Trimester mark

####### Students will write TWO formal class tests and must obtain a minimum trimester
####### mark of 40% in order to qualify to write the nal examination. e trimester mark
####### shall be calculated as follows:
####### Trimester mark = 30% of Test 1 + 70% of Test 2

N2 Electrical Trade Theory Lecturer Guide vii

6. General information

####### e regulations as prescribed in the South African National Standard
####### (SANS 10142-1), as amended, must be used with each relevant section of this
####### curriculum.
####### All symbols and units of measurement must be in accordance with the following:

* IEC (International Electrotechnical Commission)
* SI (International System of Units).

####### Practical examples, realistic values and current data must be used in all calculations
####### and explanations.

####### Neat, fully labelled and large drawings must be presented when such are required.
####### Students' artistic ability is not to be evaluated.
####### Students should be encouraged to provide in their answers the number of facts
####### according to the number of marks allocated.
####### For calculation-type questions, the following must be done:

* State the formula to be used.
* Show the substitution.
* Round off all answers to three decimal places.
* Show the SI unit.

7. Work schedule

Week Topic Content Hours 1 Module 1 Alternating current theory
1 Dynamically induced emf 1 Statically induced emf 1 e power triangle 1 ree-phase circuits
10 hours
2 Module 2 Conductors, insulators and cables
2 Conductors 2 Insulators 2 Cables
10 hours
3 Module 3 Electrical reticulation
3 Reticulation networks 3 Generation 3 Transmission 3 Distribution
10 hours
viii Lecturer guidance
Week Topic Content Hours 4 Module 4 Switchgear and protective devices
4 Switchgear 4 Switchgear – isolating 4 Switchgear – control 4 Protective devices
10 hours
5 Module 5 Batteries
5 Gel batteries 5 Lead-acid battery 5 Lithium-ion batteries
10 hours
6 Module 6 Direct current machines
6 Function and construction 6 Operation of DC motors 6 Operation of DC generators
10 hours
7 Module 7 Alternating current machines
7 Types of AC machines 7 Single-phase motors 7 ree-phase induction motors
10 hours
8 Module 8 Transformers
8 Function and construction of a single- phase transformer 8 Operation 8 ree-phase transformer
10 hours
9 Module 9 Earthing
9 e earthing chain 9 Earthing of overhead lines 9 Earthing of underground cables
10 hours
10 Module 10 Measuring instruments

10 Low-voltage measurement 10 High-voltage measurement 10 Range extension 10 Digital measuring instruments
5 hours
Module 11 Renewable energy
11 Renewable energy 5 hours
TOTAL 100 hours
x Lecturer guidance
This page may be photocopied.
LESSON
CONTENT/OUTCOMES TO BE COVERED THIS WEEK
LIST OF EXAMPLES TO BE DONE IN CLASS BY THE LECTURER TO EXPLAIN THE OUTCOME/CONCEF
FACILITATION
METHOD (PLEASE TICK)
TEACHING RESOURCES/AIDS
(PLEASE TICK)
STUDENT ACTIVITY
(EXERCISE IN
TEXTBOOK/ADDITIONAL SUPPORTING TASK) TO BE DONE THIS WEEK
WEEK 1
Lecture
White board/OHP
Group work
Models
Demonstration
Handouts
Simulation
Multimedia
INTRODUCTION TO LESSONSRECAPPING/REINFORCEMENT
N2 Electrical Trade Theory Lecturer Guide xi
This page may be photocopied.
LESSON
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FACILITATION
METHOD (PLEASE TICK)
TEACHING
RESOURCES/AIDS
(PLEASE TICK)
STUDENT ACTIVITY
(EXERCISE IN

TEXTBOOK/ADDITIONAL SUPPORTING TASK) TO BE DONE THIS WEEK
WEEK 2
Lecture
White board/OHP
Group work
Models
Demonstration
Handouts
Simulation
Multimedia
INTRODUCTION TO LESSONSRECAPPING/REINFORCEMENT
N2 Electrical Trade Theory Lecturer Guide xiii
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LESSON
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FACILITATION
METHOD (PLEASE TICK)
TEACHING
RESOURCES/AIDS
(PLEASE TICK)
STUDENT ACTIVITY
(EXERCISE IN
TEXTBOOK/ADDITIONAL SUPPORTING TASK) TO BE DONE THIS WEEK
WEEK 4
Lecture
White board/OHP
Group work
Models
Demonstration
Handouts
Simulation
Multimedia
INTRODUCTION TO LESSONSRECAPPING/REINFORCEMENT
xiv Lecturer guidance
This page may be photocopied.
LESSON
CONTENT/OUTCOMES TO BE COVERED THIS WEEK
LIST OF EXAMPLES TO BE DONE IN CLASS BY THE LECTURER TO EXPLAIN THE OUTCOME/CONCEF
FACILITATION

METHOD (PLEASE TICK)
TEACHING RESOURCES/AIDS
(PLEASE TICK)
STUDENT ACTIVITY
(EXERCISE IN
TEXTBOOK/ADDITIONAL SUPPORTING TASK) TO BE DONE THIS WEEK
WEEK 5
Lecture
White board/OHP
Group work
Models
Demonstration
Handouts
Simulation
Multimedia
INTRODUCTION TO LESSONSRECAPPING/REINFORCEMENT
xvi Lecturer guidance
This page may be photocopied.
LESSON
CONTENT/OUTCOMES TO BE COVERED THIS WEEK
LIST OF EXAMPLES TO BE DONE IN CLASS BY THE LECTURER TO EXPLAIN THE OUTCOME/CONCEF
FACILITATION
METHOD (PLEASE TICK)
TEACHING RESOURCES/AIDS
(PLEASE TICK)
STUDENT ACTIVITY
(EXERCISE IN
TEXTBOOK/ADDITIONAL SUPPORTING TASK) TO BE DONE THIS WEEK
WEEK 7
Lecture
White board/OHP
Group work
Models
Demonstration
Handouts
Simulation
Multimedia
INTRODUCTION TO LESSONSRECAPPING/REINFORCEMENT
N2 Electrical Trade Theory Lecturer Guide xvii
This page may be photocopied.

LESSON
CONTENT/OUTCOMES TO BE COVERED THIS WEEK
LIST OF EXAMPLES TO BE DONE IN CLASS BY THE LECTURER TO EXPLAIN THE OUTCOME/CONCEF
FACILITATION
METHOD (PLEASE TICK)
TEACHING
RESOURCES/AIDS
(PLEASE TICK)
STUDENT ACTIVITY
(EXERCISE IN
TEXTBOOK/ADDITIONAL SUPPORTING TASK) TO BE DONE THIS WEEK
WEEK 8
Lecture
White board/OHP
Group work
Models
Demonstration
Handouts
Simulation
Multimedia
INTRODUCTION TO LESSONSRECAPPING/REINFORCEMENT
N2 Electrical Trade Theory Lecturer Guide xix
This page may be photocopied.
LESSON
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FACILITATION
METHOD (PLEASE TICK)
TEACHING
RESOURCES/AIDS
(PLEASE TICK)
STUDENT ACTIVITY
(EXERCISE IN
TEXTBOOK/ADDITIONAL SUPPORTING TASK) TO BE DONE THIS WEEK
WEEK 10
Lecture
White board/OHP
Group work
Models
Demonstration

Handouts
Simulation
Multimedia
INTRODUCTION TO LESSONSRECAPPING/REINFORCEMENT

This afternoon's online lesson is based on the Construction Level 2 subject for NC(V) students.

The topic: Differentiation Rules and Equation of Tangents
Open
This afternoon's online lesson is based on the Construction Level 2 subject for NC(V) students.

The topic: Measuring and Setting Out.
Open
This morning's online lesson is based on the Plant and Equipment Level 3 subject for NC(V) students.

The topic: Internal Combustion Engine
Open
This morning's online lesson is based on the Fitting and Turning Level 2 subject for NC(V) studen
The topic: Milling Machine
Open
This morning's online lesson is based on the Mathematics Level 4 subject for NC(V) students.

The topic: Integration (Part 2)
Open

N1 Topics
N1 Electrical Trade Theory

Open
N1 Engineering Drawing
Open
N1 Motor Trade Theory
Open
N1 Industrial Electronics
Open

N1 Mathematics
Open
N1 Bricklaying and Plastering Theory
Open
N1 Building Drawing
Open
N1 Fitting & Turning Theory Module 8
Open
N1 Fitting & Machining - Module 14 - Centre Lathes
Open
N2 Topics
N2 Mathematics
Open
N2 Motor Trade Theory
Open
N2 Electrical Trade Theory
Open
N2 Engineering Drawing
Open
N2 Engineering Science
Open
N2 Industrial Electronics
Open
N2 Fitting & Machining Theory - Module 10
Open
N2 Fitting & Machining Theory V-Belts
Open
N1 Fitting & Machining Theory Module 13 Cutting Tools
Open
N2 Electrical Trade Theory - Module 6 - Protection
Open
N2 Fitting & Machining Theory - Module 14 Reduction Gearboxes
Open
N3 Topics
N3 Engineering Science
Open
N3 Industrial Electronics
Open
N3 Mathematics
Open

N3 Mechanotechnology
Open
N3 Electrical Trade Theory
Open
N3 Mechanotechnology Module 8
Open
N3 Mechanotechnology - Module 10 Pneumatics
Open
N3 Electrical Trade Theory
ZIP
N4 Topics
N4 Industrial Electronics
Open
N4 Mathematics
Open
N4 Mechanotechnics
Open
N4 Child Health
Open
N4 Daycare Personnel
Open
N4 Electrotechnics
Open
N4 Catering Theory and Practical
Open
N4 Nutrition and Menu Planning
Open
N4 Sanitation and Safety
Open
N3 Electrotechnology
Open
N4 Human Resource Management
Open
N4 Introduction to Financial Accounting
Open
N4 Public Administration
Open
N4 Educare Didactics
Open
N4 Education

Open
N4 Computer Guide Practice Du Toit
Open
N4 Computer Practice De Villiers
Open
N4 Computerised Financial Systems
Open
N4 Entrepreneurship & Business Management
Open
N4 Financial Accounting
Open
N4 Education Module 1
Video
Open
L4 Systems Analysis & Design Topic 3
Open
N4 Mass Media Communication
Part 1 - Video
Open
N4 Mass Media Communication
Part 2 - Video
Open
N4 Mass Media Communication
Part 3 - Video
Open
N4 Mass Media Communication
Part 4 - Video
Open
N4 Mass Media Communication
Part 5 - Video
Open
N4 Mass Media Communication
Part 6 - Video
Open
N4 Education Module 1
Open
N4 Management Communication - Minutes of a meeting
Open
N4 Management Communication - Module 5
Open

N4 Management Communication - Module 6
Open
N4 Marketing Management Module 3
Open
Marketing N4 1 - Video
Open
Marketing N4 2 - Video
Open
Marketing N4 3 - Video
Open
Marketing N4 4 - Video
Open
Marketing N4 5 - Video
Open
Marketing N4 6 - Video
Open
N5 Topics
N5 Marketing Management Module 1
Open
N5 Marketing Management Module 2
Open
N5 Marketing Management Module 3
Open
N5 Marketing Management Module 4
Open
N5 Mathematics
Open
N5 Electrotechnics
Open
N5 Industrial Electronics
Open
N5 Sales Management
Open
N5 Human Resource Management
Open
N5 Human Resource Training
Open
N5 Municipal Administration
Open
N5 Public Administration

Open
N5 Public Relations
Open
N5 Computer Guide Practice Du Toit
Open
N5 Computerised Financial Systems
Open
N5 Cost and Management Accounting
Open
N5 Entrepreneurship & Business Management
Open
N5 Financial Accounting
Open
N5 _ N6 Public Finance
Open
N5 Computer Guide Practice De Villiers
Open
N5 Daycare Communication
Open
N5 Educational Psychology
Open
N5 Sales Management Module 10
Open
Office Practice N5 Topic 7 Insurance
Open
Office Practice N5 Topic 7 Tele Communication
Open
N5 Computer Practice Theory
Open
N5 Sales Management Module 6
Voice Note
Open
N5 Sales Management Module 11
Open
N5 Computer Practice - Mail Merge & Access
Open
N5 Marketing Management
Open
N6 Topics
Information Process N6 Topic 9 Flow Charts

Open
LR N6 Module 3 - Collective bargaining
Open
N6 Electrotechnics
Open
N6 Mathematics
Open
N6 Daycare Communication
Open
N6 Municipal Administration
Open
HLANGABEZA MT (MUNICIPAL ADMIN N6)
Open
N6 Public Administration
Open
N6 Public Law
Open
N6 Sales Management
Open
N6 Daycare Management
Open
N6 Human Resource Management
Open
N6 Human Resource Training
Open
N6 Income Tax
Open
N6 Marketing Communications
Open
N6 Marketing Research
Open
N6 Computer Practice
Open
N6 Computerized Financial Systems
Open
N6 Cost and Management Accounting
Open
N6 Entrepreneurship & Business Management
Open
N6 Financial Accounting

Open
N6 Educare Didactics
Open
N6 Psychology Module 3
Open
N6 Sales Management
Voice Notes
Open
INFORMATION PROCESSING N6 financial statement (TOPIC 10)
Open
IP N6 FINANCIAL STATEMENTS
Open
Various Topics
Level 2
Maths Lit L2 Topic 2
Voice Note
Open
New Venture Creations L2 Topic 2 Summary Slide Show - Future Managers Mrs Strydom
Open
LIFE ORIENTATION
L2
Open
OFFICE PRACTICE LEVEL 3 LESSON 1.22
Open
L2 EBM Topic 2
Open
L2 Animal Production Poultry Feeding
Open
L2 New Venture Creation Module 1
Open
L2 New Venture Creation Module 2
Open
L2 New Venture Creation Module 3
Open
L2 English FAL - Business letters
Open
L2-L4 English FAL Intervention Excercises
Open
MacMillan L2 English FAL Module 1
Open

MacMillan L2 English FAL Module 2
Open
L2 Business Practice - Topic 3
Open
L2 Business Practice Module 10
Open
L2 English FAL Module 3
Open
L2 Transport Economics
Open
L2 Transport Operations - Typical Operations across various transport modes
Open
L2 Physical Science - Electricity & Magnetism
Open
L2 Plant Production - Module 1 - Lesson 2 Vegetable Production
Open
L2 Plant Production - Module 1 - Vegetable Production
Open
L2 Soil Science - Soil & their Components
Open
L2 Animal Production - Diseases in Poultry
Open
L2 Food Preparation - Module 10 Part 1
Open
L2 Food Preparation - Module 10 Part 2
Open
L2 Food Preparation - Module 10 Part 3.1
Open
L2 Food Preparation - Module 10 Part 3.2
Open
L2 Food Preparation - Module 10 Part 4
Open
L2 Food Preparation - Module 10 Part 5
Open
L2 Food Preparation - Module 10 Part 6
Open
L2 Food Preparation - Module 10 Part 7.1
Open
L2 Food Preparation - Module 10 Part 7.2
Open

L2 Food Preparation - Module 10 Part 8,9,10
Open
L2 Agribusiness - Module 2 - Importance of Marketing
Open
L2 English FAL - Topic 3 - Blog Writing
Open
L2 Life Orientation - Substance Abuse
(Zipped File, please download and unzip)
ZIP
L2 Plant Production - Unit 4 Choosing Vegetable Crops
Open
L2 Agribusiness - Module 2 - Gaining Access to Markets
Open
L2 Life Orientation - Module 7 Balanced Lifestyle
Open
L2 Life Orientation - Module 8 Substance Abuse
Open
L2 Life Orientation - Module 9 Human Sexuality
Open
L2 Life Orientation - Module 10 Fire Safety Measures
Open
L2 Plant Production - Unit 4 Choosing Vegetable Crops
Open
Level 3
English L3 Topic 3
Open
ECDE L3 Bipolar Juction Transistor
VIDEO
Open
ECDE L3 Module 4&5
VIDEO
Open
English L3 Topic 4
Voice File
Open
L3 Electrical Principles and Construction Topic 4
Open
L3 Marketing Communication Topic 3
Open
Future Managers Presentations for New Venture Creation L3 Module 1

Open
Future Managers
Presentations for New Venture Creation L3 Module 2
Open
Future Managers
Presentations for New Venture Creation L3 Module 3
Open
Future Managers
Presentations for New Venture Creation L3 Module 4
Open
L3 LO - Health & Wellbeing
Open
L3 Soil Science - Fertilization of Soils
Zipped File. Please download and unzip
ZIP
L3 Office Practice - Cancelling & Postponing Appointments
Open
L3 Office Practice Topic 4 Module 10
Open
L3 Transport Economics - Macro & Micro View
Open
L3 Animal Production - Module 2 Rearing Practices for Lambs
Open
L3 Animal Production - Topic 2 Wool bearing sheep breeds
Open
L4 English FAL Topic 3 - Argumentative Writing
Open
L3 Physical Science - Electromagnetism
Open
L3 Soil Science - Soil Sampling Procedures
Zipped File. Please download and unzip
ZIP
L3 Animal Production - Module 2 - Unit 2 Weaning
Open
L3 Physical Science - Electromagnetic Induction
Open
L3 Animal Production - Module 2 Unit 3 - Rearing Practice for Ewes and Rams
Open
L3 Life Orientation - Module 4
Open

L3 Life Orientation - Module 5
Open
L3 Life Orientation - Module 6
Open
L3 Life Orientation - Module 7
Open
L3 Life Orientation - Module 8
Open
L3 Life Orientation - Module 9
Open
L3 Life Orientation - Module 10
Open
L3 Mathematics - Space, Shape and Orientation
Open
L3 Agribusiness - Module 2 Topic 1
Open
Level 4
Maths Lit L4 Module 1.2.6
Voice File
Open
L4 English E-Book LADIES' DETECTIVE AGENCY
Open
LO Level4 Topic3 Part1
Voice File
Open
LO Level4 Topic3 Part2
Voice File
Open
LO Level4 Topic3 Part3
Voice File
Open
LO Level4 Topic3 Part4
Voice File
Open
LO Level4 Topic3 Part5
Voice File
Open
LO Level4 Topic3 Part6
Voice File
Open

LO Level4 Topic3 Part7
Voice File
Open
System Analysis & Design Level4 Topic3 Lesson1
Open
Future Managers Presentations for L4 Personal Assistance Module 1
Open
Future Managers Presentations for L4 Personal Assistance Module 2
Open
Future Managers Presentations for L4 Personal Assistance Module 3
Open
Future Managers Presentations for L4 Personal Assistance Module 4
Open
Construction Supervision L4
Open
L4 Electrical Principles & Practice - Topic 4
Open
N4 Electrotechnics
Open
L4 Marketing Module 5
Open
L4 Animal Production - Cattle Breeds
Open
L4 Personal Assistance Module 6
Open
L4 Personal Assistance Module 7
Open
L4 Life Orientation Topic 3
Open
L4 Freight Logistics - Government Procurement Process
L4 Life Orientation Topic 3
L4 Life Orientation Topic 3
L4 Marketing Communication Topic 4
Open
L4 Marketing Communication Topic 5
Open
L4 Marketing Communication Topic 6
Open
L4 Freight Logistics - Government Procurement Process
Open

L4 Transport Economics - The transport market and the Economy
Open
L4 Transport Operations - Capacity Planning, Optimisations and route scheduling
Open
Mathematics L4
Open
L4 Advanced Plant Production - Topic 1 - Plant Propagation
Open
L4 System Analysis & Design Part 1
Open
L4 System Analysis & Design Part 2
Open
L4 System Analysis & Design Part 3
Open
L4 System Analysis & Design Part 4
Open
L4 System Analysis & Design Part 5
Open
L4 System Analysis & Design Part 6
Open
L4 System Analysis & Design Part 7
Open
L4 English FAL Topic 3 - Reflective Writing
Open
L4 Agribusiness - Integrated Management of a Small Agricultural Enterprise Part 1
Open
L4 Agribusiness - Part 2 Answers to Assessment
Open
L4 Life Orientation - Module 10 Advocate Road Safety Measures
Open
L4 Life Orientation - Module 11 Describe Workers Rights and Responsibilities
Open
L4 Life Orientation SO3.3
Zipped File-Please download and unzip)
ZIP
L4 Construction Supervision - Topic 6
Open
L4 Agribusiness - Presentation 2 Unit 1.2
Open
L4 Agribusiness - Presentation 3 Unit 1.2

Open
Marketing Modules
MODULE 1 PRODUCT POLICY
Open
MODULE 2 - DISTRIBUTION POLICY
Open
MODULE 3 - PRICING POLICY
Open
MODULE 4 - PROMOTIONAL POLICY
Open
Microsoft OFFICE and other misc modules
CP, IP & ODP Multilevel Numbering Part 1
Open
CP, IP and ODP Multilevel Numbering Part 2
Open
PLP Mathematics - Module 2 Factorisation
Open
Welding - Shielded Metal Arc Welding
Open
Unit Standard 116936 End User Computing - Microsoft Access
Open
PLP Science - Unit 2.3 Heat & Temperature
Open
Unit Standard 91761 Electrical Phase 1
Open
Unit Standard 261659 Build Masonry Super Structures using Solid Units
Open
PLP English Positive & Negative Sentences
Open
Skills Boilermaking Lifting Techniques
Open
Skills Boilermaking - Lay out and mark-off pipe work sections
Open
Total Page Visits: 51582 - Today Page Visits: 8
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Dhet ,saqa,qcto ,scope teach learner

DHET , TVET /
college nated exam plan college
-Teach and learning plan 2022./2023
Lecture , dhet an St peace college internal external learner
Portofilio textbook.
Student learner name : tshingombe tshitadi
- part 1 framework and conceptual underpinning of plan .
1. Purpose of the plan:

Planing examination national trade examination term and Semmester in college framework ,module circulum Assessment evaluation test 1,2exercise book learning faculties diploma national coverage time table allocation studies engineering electrical and engineering college peer assessment,self assessment and group assignment subt completed , in college and institut police engineering institute , qualifications implementation n diplomat saqa frame work l activities and councils trade test practical .
- assignment class work internal assessment and external Assessment college nated technical vocational and technical College,training college , coverage internal assessment.problem based instituts engineering and instituts police Portofilio evidence.
Coverage engineering police and traffic police engineering, subject.lecuture teach and learner .
2.Aim of plan : vision college and mission college and instituts examination subject

,basic advanced research and filling Engineering electrical mission ,planing school disciplinary are circulum assessment police department
Input output policy orientation guideline learner college must design engineer,and analyse discovery job vision dhet examination policy ,and saqa policy must meet. Criteria examinator planing circulum.

3. Objective of the plant: the exams inationa national trade department and internal external examiner assignment objectivity learner to qualify and learner the end of examination should be able to correct to implement to labal to retain and restitution faculties eny criteria to improved t take measurements in different ways of engineering electrical.
4.Conceptual underpinning of plan
Lecture and learner planing course class model design ,module ,week completed exercise book.time allocation:
Framework regulatority. Engineering studies business Engineering location

5.Underpinning philosophy for delivery of quality teach Ong and learning in TVET college.
Teaching .: Report self ast and Peet assessment St peace college internal external term was 3 month qualify Engineering studies business diplomat internal diplomat was record report certificate years ,completed scale internal test class work homework record years assessment completed filing Portofilio evidence topics coverage lecture note and learner self assessment an peer assessment critical objectivity learner delivery ,lecture anual report principal and rectorat examination external. Statement of results for registration attandance regularity or irregularitirs learner report process learner theory expiremental and practical for n diplomat studies business engineering n 1,2,3,4,5,6 years lecture and professor doctoral work textbook and class work reading and professional orientation vocational examination trade subjects and Engineering electrical subjects , College St peace policy guidelines for Poe s works years memorendum exam.
.-6 Key delivery area : in the plan.
Statement and certificate coverage compare marks years college and instituts and test class work40%, 60% exam statement criteria plan module 3 month Engineering electrical subjects research.

-7 the embededness of the teaching and learning plan in college strategy and operationel:, research in college and instituts focused examin evaluation was undercover lecture weekend an learner weekend,
-8 Implementation and monitoring of the teaching and learning plan topic ,trade engineering national work research Assessment completed years methodology criteria research textbook learner.
-9 reviews and adaptation of the plan in successive, the planing submitted on internal and exter ast learner and teacher nated ,seta engineering faculty St peace College completed time table planing, completed
Time table orientation principal: circulum Assessment evaluation design engineering electrical faculty engineering time table learner policing and college operationel time table period movement time morning to afternoon daily weekly move job circulum years design developmen system ,subject engineering electrical and information to. Business Engineering.to national trade subject reports

Orientation
10.Addendum not completed response :

-College: St peace college and instituts Afric police.
-completed by : tshingombe tshitadi
- designation:

-Section /output planned activity//report///corrective mesure//// targate date completed..

Section
output planned activity
//report
///corrective mesure
//// targate date completed..

--sect: workplacement ,student and lecturer.

-Planni g output , activities/verification minimum//evidence///responsible office design////activi
output completed/////activities output not completed ///////target date for completion

Planni g output
activities
verification minimum
evidence
responsible office design
output completed
activities output not completed

-Program in renewable energy offer/enrollment programmation
- college WP student adhere // update college policy .
- process in place network identify industry, action plan ,strategy plan

e

2.purpose:

.QCTO: Occupational qualifications skill programme , development report required qualifications documents final verification meeting.

1.Qcto approved application for which qualifications.
-Curriculum template ,CV report 10 days after CV finalisation.
-scoping report template compile 10 working day after the meeting ..
- St peace college full time class study practi,national certificate n1,2,3 eny content mathematics electrotech,logic industrial study career field engineer electricity electronics and electromagneti Engineering dynamic field engineer resposable for generations transfers and conversion of elect power these after engineering are demanding positi industrial , ,,qualification to equipment your self basic electric to ,star CCTV business use CCTV,camera, monitor fixe indoor outdoor ,,
- design planing ,research advanced field ,endergo planning system skill planning system skill planner next , development skills components,science natural mathematics. Hemistry device protection components, ensuring maintence. Are components, discovery skill ,idde improve ,inspect find faut.
.1.. trade test QCTO..saqa
criteria measure the power of learning trade marks of Education testing services;
- prepare for criteria Assessment test : cognitive exam skill test personality assessment job test prepo.. discovery practical question ,score report,full explanation, review amount ..
Employment for learning and teachy lecture test service ,test design ..college business class worl
-engineering electrical aptitude 30- minute test designed ,criteria skill test ,test criteria exam consist question marks typing 1 minute test mesure trade theory electric ,mathematics, Engineering science,, panel control wire .test installation item drawing electrical .
Minute..
- prepare criteria test :
time table nated
- trade mark holder property : .....St peace college workshop class work ..
-Licensed electrician' s Assessment
Apprenticeship.passing asssessment categor(y(.LEA) 15 minutes
-licen sed electricians theory .(LET)..

-the licensed electrician practice (LEP)
Practical test spleet wiring a meter box and switcboor men system test identify.
- Comment on Licensed.: Week basic licensed , week number reading comprehension test , numerical reasoning test spatial science test.
- trade apprenticeship apptitude test ,time test , questions, pass score .100marks , ..
- iron works, elevator industrial..
- mathematics problem reason give day work produce,spacial ,,
- mechanical reason problem ,tools electric circuit point ,point ,physic question force , ..
- compagny electrical trade qualifict question theory apprenticeship,class book electrical theory DC ,AC voltage converter cycle ,motor efficiency symptoms,phase ,Va apparent power current calculation properties operating , electronics operating principle test for Dios , diode rating replacement value ,
- construction soldering connection,,power transfo..
- trade o jectif install troubleshooting cabling communication,
-manufacture compagnie :
Site ,plan ...
- customer date completed .
- determiner later and install and tear patients care system installing conduit component and verify, operationel system ,accordt install and ,test security system test selected operating measure .. outcom trade engineering
-test nated Assessment required task ,step ,input equality operationel basic advanced plant mathematics diffential derivation fundamental theories low ,,
Operationel lineariye system equation system lineaire process force ,limited , different fabric force , ,,lineare AC,DC, semie
Code trade.
[X]

QCTO:
3.Purpose: of course daily course tender provider service require trade ,skill report ,phase ,1,2,3 trade test readiness close report . weekend attandat.
-tender number ....

1 .module / code // module object/// code criteria.
- inducty saft hand tools /recall application man power / relevant coulor marking correct sabs ///
recall the operation diffet type module subject correct .
Conductor,joint conductor ,crimoingsoldering prepare,soldering fault find control panekcontact,
,Correct test instrumr, db fuse AC motor control short circuit ,single phase ,mecanicak
fault ,fluorescent installation ,phase squirei motor dolautitransfi , commission transmission,
transmission generation,measure,
Electronic compont resistor electrolytic diode ceramic diode transistor thyristor triac ,stable
vibratory wave average , correct manufacture,
- chain block shockl max works not exceed , // correct cable gears relate years certificate trade
clear time frame , training plan..
- company theoretical mathematics subject certiy,module check all settings
[X]

4- purpose :
and scope:
saqa , qualifications implentation , statement submitted, statement of work experience,
I'd transcription meeting 71638, primary status registration saqa Assessment 0912 saqa
instuty ,30-39 , assessment policy IE099-IEOO, regulation internal saqa decision advance
intermediate phase teach , ... agreement ..
Training reg ,com 182609001 seta
Dhet exam id 210002023812, I'd 2004007064381,, ..
Assessor award degree diplomay number not meet and institut award
202303115021 submission numbers,
, N diplome engineering statement
Of work , saqa I'd 90674, NQF level 6, 360 ,saqa learning 67043, .instruction
. statement .

N1,saqa I'd 67109,n 2 saqa I'd 67375, saqa I'd 67491,
- evaluation asssessment
90674: national n diplomat engineering..
1. Qns .Where appropriate applying lubricant correctly to assembly in accordance with specifications and standard operayprocedure...
Required , where appropriate applying packing material in accordance with specifications standa operating procedures, ,inspection final ,assembly conformance , where appropriate returning fir assembly to use , diagnose and repair analogue equipment , obtaining and following relevant circuit diagram Manuel schematic ,maintenance record ,locating diagnostic built fault, obtained code interpretation documents,tuning test functionalite and recording fault and equipment , checking electronics equipment assembly,component connection ,
Removing and replacing repairing components from electronic , recording test understanding or electronics , isolating electronics assembly from power adjusting , calibrating electronics equipment ,returning to service testing to specification , returning to service and test to specification the repairs electronic equipment using language and literacy provide, using langy skill , equipment fault find ,reproducting symptoms and verify g ,maintain see ice digital electronics ,look for evidence relevant circuit diagram Manuel schematics maintenance supplielocati g record build , maintence error code interpretation documents running test function ,checking removing and replacing components,, interpretation technical drawing lookin evidence checking the drawing againg ,procedure interpreting information drawing writing documents checking clarifying , understaking numerical operation geometry calculation ,termina xonecct ,check material connection and regulatority requirement ,adjusting and fixing wiring, marking,rigging labelling connection , undertaking testing connection for conformance ,component test AC 15000 volt ..
Marking component dissembling , settings up appropriate test and calibration equipment, settin the controller mode system , completed report commission the control interpretation information ,,
-1.1 ans..How to apply for job research hiring compagnies trade nated to qualified workshop anc to council lab workshop school experience time table counsulta,subject reports ready resumes submitted job oersonek..
- basic in Quality inspection check variable appears understand quality experience.
Trade ..
Manufacture inspection , pulling random ,checking product Gain ,verify packing required,shippe packing check point dimension shopper ,check instruction measure chipper gross gives value ,measure cartoon gross weight and compare , shipper material layer sealing card singy, critical defect fail inspection ,,
- maintain repaired electronics planned maintain scheduled , multimeter ,resistor inductor components testing using ,soldering technical basic , circuit board fault finding finding electronic instrument and system mechanic,, .
-width of panel size terminal side switch ,size for component depth ..

- responsible : original documents it document review obtained number prior to Dec routine assure that document sraft DC number checking log documents entering ,,
- material drawing afoi g check appropriate charts list applicable calculate formulr , installation drawing provide how compagny position , Assem ly drawing explosed diagram model schematic ,machine drawing ,machine shop drawing ,expertise order to create machine ..
- labalked standard ,markers line ,colouring option ,labali g very small,wath belongh. Electric Las "choosing quality conduit heath shrink labelling self printed ,maintain diameter labej letter ,labej house ,voltage runi g, identification b,source ,power source ,usage, heat shrink,conduit tag,fault wiring ,overload circuit,indicator,size , assessment,non metal labej ,cable indicate size gauge wir inside plastic , w G ground wire material all alumini,tools terminal connected,cable contain insulati ,

[X]

[X]

DHET..
Purpose:
completed time table implentation coverage Summative regularity, subject n1,n6 , asservissemn task assignment homework, marks allocation. 310x 6 , module , content module scaling. 100 marks , student program, asssessment tools marking memorandum ,
Isat.icass continued assessment ,
-Body quality insurance re certificate rating low,
..outcom scotiss qualifications value Assessment Portofilio I Engineering low ,teacher lecture judging evidence ,subject Quality Assurance, the completed solutions, recorded programs assign short ,re- assessment develop Engineering , analyse Probly, designing a straight problem, simulating or constructing ,
candidate class
part question
operationel skill
reasoning skill total point achieve

- candidate class /,part question ,//operationel skill/// reasoning skill total point achieve, Mandatory skill development course analyse staring , ,d..
Topics ,nated levej subject module..
- applyy math skill to manupulr low and working skill , cLccul ,
Applied Engineering electric skill analyse .. administration information.
, description of charge, authority ,
Conducting the assessment: high judging evidence internally marked and verified , re - assesmer unit assesment ..
-Question / point of process or accuracy //expected responses
- checks length correct conclusion/ evidence correct reason other draw..-

- / evidence of appropriate add sub correct ,
Correct answer..
-evidence module total examin ER composite ,overall strategy square ..

- totalprocessand accuracy point for test total reasoning....
-isat integrity icass assessment subject .
Conceptual question problem hydro electric generator concept assuming unit, conversion wath current ,
- integrated concept ligth trading concept cost heater , power

[X]

On Fri, May 12, 2023 at 8:21 AM TSHINGOMBEKB TSHITADI > wrote:
Hello dear

On Mon, 08 May 2023, 14:38 TSHINGOMBEKB TSHITADI, > wrote:
Enquiry:to national examination and assessment college principal organisation . Chief invigilator commited irregularity
-chief directorates national examination
Dhet./ And SAQA evaluation/QCTO,
Registrar /
Mr:Pdevilliers.
Application from:

Student ID: 2100002023812.
Student name.tshingombe Tshitadi
College instituts name St peace college
Exam :external shalom technical :
.899993812
:Afric policing instituts
-Memorandum :2023/0508
Requested letter reasoning for :
release finalize n diplomat studies engineering electrical
_____
Good day dear :
I'm applying to claim for your attention in your department and instituts to regarding my application
In consolidation .
Release of November examination to verify the outcome of irregularilarity observed the quality assurance bodie responsibility for TVET college qualification n diplomat engineering studies electrical engineering.
Didn't have received the letter approved release November engineering studies subject under investigation and invalid subject n3 trade electrical theory transcript registrar tick sign to day of exam n4 electrotech chief invigilator and assessment deal with 21 days of publication and consic all evidence a ailable make decisions base will notify the examination as soon it possible it finalized, candidate fail to submit additional information receipt. Statement submitted number 1980/11/10..notify 1982/11/10 N4 fail druip. Review statement n1,n2,n3,n4 statement released marking scale submitted Portofilio evidence Poe s engineering electrical time table college privat system assessment police , evidence docket documents examination reference student examination semester 4, Portofilio online send additional information system to saqa instituts foreign award meeting requireded documents completed exam dhet framework engineering electrical icass evidence based topics scaling process on line meet award certificate investigatior documents police criteria , council quality.meet Conductor asssessor saqa . engineering criteria.marking in progress documents Portofolio value assessment police and engineering cour

Dhet.
We are alert your attention in department busy conducting subject investigation and envisaged that the result will be release by it responsabilite,inform that candidate release subject on line The department of labour electrical and engineering still busy finalising the mechanical of engineering examinations script plant engineering the results in certificate all effected candidate Portofilio labour expiremental icass in circulum saps seta sasseta CETA verification for trade practices panel electrical wiring.plumving in trade theory

base engineering design investigation
additional information evidence base .
Examination national irregularilarity committee n4-n6...n1-n3 appealing process ,and activity notice letter to get instituts notify candidate outcome of the meeting serious,closing date registration final submission of script letter 21days affidavit submission and final..
Ref. All affected candidate who do not received their results immediately must be registered to rerwiten subject during next examination cycle as note late entree will be accepted in Portofilio assessment topic and completed submitted additional information system and the application proof must be submitted a register must be compiled on the template provided and send to the owner.no application for remark received after close date will be deemed irregularilarity and not be processed . examination centre responsible for refunding candidate in case of application submitted ofter closing.
The according to national conduct policy the script may be destroyer 6monty after the release of the results for business month for engineering no application for remark re check of script will be accepted beyond and receive November February,2023 exam cycle,and all candidates who have pending outcome resultat and have not received the outcome are mark re-maek recheck proces must be registered for the next examination cycle no late entries will be accepted,
Code 1104126, subject electrical trade theory ,level 3 reason under investigation .the process in Portofilio evidence topics learner in saqa documents meeting requireded.
Thanks u for your attention.

National Treasury EMail Disclaimer

For inquiries refer to case **Incident # 1579970** as your reference number

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Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Friday excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.z

This is to confirm that an incident was logged On: 2023/08/20 10:57:26 AM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za Sun, Aug 20, 10:57 AM (7 days ago)

to me

Dear tshingombefiston tshingombefiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**1579995**
Summary:	Re: Dhet ,saqa,qcto ,scope teach learner
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	3
Status:	Logged

Category:

Description

Important: This email originated from an external sender. Please do not click on email links or open attachments you did not expect. When in doubt, please contact the ICT Service Desk.

On Fri, Aug 18, 2023 at 4:48 PM TSHINGOMBEKB TSHITADI > wrote:
DHET , TVET /
college nated exam plan college
-Teach and learning plan 2022.
Lecture , dhet an St peace college internal external learner
Portofilio textbook.
- part 1 framework and conceptual underpinning of plan .
1. Purpose of the plan:
Planing examination national trade examination term and Semmester in college
framework ,module circulum Assessment evaluation test 1,2exercise book learning faculties
diploma national coverage time table allocation studies engineering electrical and engineering
college peer assessment,self assessment and group assignment subt completed , in college and
institut police engineering institute , qualifications implementation n diplomat saqa frame work l
activities and councils trade test practical .
- assignment class work internal assessment and external Assessment college nated technical
vocational and technical College,training college , coverage internal assessment.problem based
instituts engineering and instituts police Portofilio evidence.
Coverage engineering police and traffic police engineering, subject.lecuture teach and learner .
2.Aim of plan : vision college and mission college and instituts examination subject ,basic advanc
research and filling Engineering electrical mission ,planing school disciplinary area circulum
assessment police department
Input output policy orientation guideline learner college must design engineer,and analyse
discovery job vision dhet examination policy ,and saqa policy must meet. Criteria examinator
planing circulum.
3. Objective of the plant: the exams inationa national trade department and internal external
examiner assignment objectivity learner to qualify and learner the end of examination should be
able to correct to implement to labal to retain and restitution faculties eny criteria to improved t
take measurements in different ways of engineering electrical.
4.Conceptual underpinning of plan
Lecture and learner planing course class model design ,module ,week completed exercise
book.time allocation:
Framework regulatority. Engineering studies business Engineering location

5.Underpinning philosophy for delivery of quality teach Ong and learning in TVET college.
Teaching .: Report self ast and Peet assessment St peace college internal external term was 3 month qualify Engineering studies business diplomat internal diplomat was record report certificate years ,completed scale internal test class work homework record years assessment completed filing Portofilio evidence topics coverage lecture note and learner self assessment an peer assessment critical objectivity learner delivery ,lecture anual report principal and rectorat examination external. Statement of results for registration attandance regularity or irregularitirs learner report process learner theory expiremental and practical for n diplomat studies business engineering n 1,2,3,4,5,6 years lecture and professor doctoral work textbook and class work reading and professional orientation vocational examination trade subjects and Engineering electrical subjects , College St peace policy guidelines for Poe s works years memorendum exam.
.-6 Key delivery area : in the plan.
Statement and certificate coverage compare marks years college and instituts and test class work40%, 60% exam statement criteria plan module 3 month Engineering electrical subjects research.

-7 the embededness of the teaching and learning plan in college strategy and operationel:, research in college and instituts focused examin evaluation was undercover lecture weekend an learner weekend,
-8 Implementation and monitoring of the teaching and learning plan topic ,trade engineering national work research Assessment completed years methodology criteria research textbook learner.
-9 reviews and adaptation of the plan in successive, the planing submitted on internal and exterr ast learner and teacher nated ,seta engineering faculty St peace College completed time table planing, completed
Time table orientation principal: circulum Assessment evaluation design engineering electrical faculty engineering time table learner policing and college operationel time table period movement time morning to afternoon daily weekly move job circulum years design developmen system ,subject engineering electrical and information to. Business Engineering.to national trade subject reports

Orientation
10.Addendum not completed response :

-College: St peace college and instituts Afric police.
-completed by : tshingombe tshitadi
- designation:
-Section /output planned activity//report///corrective mesure//// targate date completed..

--sect: workplacement ,student and lecturer.

-Planni g output , activities/verification minimum//evidence///responsible office design////activi
output completed/////activities output not completed ///////target date for completion
-Program in renewable energy offer/enrollment programmation
- college WP student adhere // update college policy .
- process in place network identify industry, action plan ,strategy plan

National Treasury EMail Disclaimer

For inquiries refer to case **Incident # 1579995** as your reference number

This is a system generated e-mail and is for confirmation purpose only.

Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Frida
excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

This is to confirm that an incident was logged On: 2023/08/20 10:57:26 AM (UTC 02:00) - Africa/Johannesburg

Inbox

csd@treasury.gov.za Sun, Aug 20, 10:57 AM (7 days ago)

to me

Dear tshingombefiston tshingombefiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**1579995**
Summary:	Re: Dhet ,saqa,qcto ,scope teach learner
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	3
Status:	Logged
Category:	

Description

Important: This email originated from an external sender. Please do not click on email links or open attachments you did not expect. When in doubt, please contact the ICT Service Desk.

On Fri, Aug 18, 2023 at 4:48 PM TSHINGOMBEKB TSHITADI > wrote:
DHET , TVET /
college nated exam plan college
-Teach and learning plan 2022.
Lecture , dhet an St peace college internal external learner
Portofilio textbook.
- part 1 framework and conceptual underpinning of plan .
1. Purpose of the plan:
Planing examination national trade examination term and Semmester in college framework ,module circulum Assessment evaluation test 1,2exercise book learning faculties diploma national coverage time table allocation studies engineering electrical and engineering college peer assessment,self assessment and group assignment subt completed , in college and institut police engineering institute , qualifications implementation n diplomat saqa frame work l activities and councils trade test practical .
- assignment class work internal assessment and external Assessment college nated technical vocational and technical College,training college , coverage internal assessment.problem based

instituts engineering and instituts police Portofilio evidence.
Coverage engineering police and traffic police engineering, subject.lecuture teach and learner .
2.Aim of plan : vision college and mission college and instituts examination subject ,basic advanc research and filling Engineering electrical mission ,planing school disciplinary area circulum assessment police department
Input output policy orientation guideline learner college must design engineer,and analyse discovery job vision dhet examination policy ,and saqa policy must meet. Criteria examinator planing circulum.
3. Objective of the plant: the exams inationa national trade department and internal external examiner assignment objectivity learner to qualify and learner the end of examination should be able to correct to implement to labal to retain and restitution faculties eny criteria to improved t take measurements in different ways of engineering electrical.
4.Conceptual underpinning of plan
Lecture and learner planing course class model design ,module ,week completed exercise book.time allocation:
Framework regulatority. Engineering studies business Engineering location

5.Underpinning philosophy for delivery of quality teach Ong and learning in TVET college.
Teaching .: Report self ast and Peet assessment St peace college internal external term was 3 month qualify Engineering studies business diplomat internal diplomat was record report certificate years ,completed scale internal test class work homework record years assessment completed filing Portofilio evidence topics coverage lecture note and learner self assessment an peer assessment critical objectivity learner delivery ,lecture anual report principal and rectorat examination external. Statement of results for registration attandance regularity or irregularitirs learner report process learner theory expiremental and practical for n diplomat studies business engineering n 1,2,3,4,5,6 years lecture and professor doctoral work textbook and class work reading and professional orientation vocational examination trade subjects and Engineering electrical subjects , College St peace policy guidelines for Poe s works years memorendum exam.
.-6 Key delivery area : in the plan.
Statement and certificate coverage compare marks years college and instituts and test class work40%, 60% exam statement criteria plan module 3 month Engineering electrical subjects research.

-7 the embededness of the teaching and learning plan in college strategy and operationel:, research in college and instituts focused examin evaluation was undercover lecture weekend an learner weekend,
-8 Implementation and monitoring of the teaching and learning plan topic ,trade engineering national work research Assessment completed years methodology criteria research textbook learner.
-9 reviews and adaptation of the plan in successive, the planing submitted on internal and exterr

ast learner and teacher nated ,seta engineering faculty St peace College completed time table planing, completed
Time table orientation principal: circulum Assessment evaluation design engineering electrical faculty engineering time table learner policing and college operationel time table period movement time morning to afternoon daily weekly move job circulum years design developmen system ,subject engineering electrical and information to. Business Engineering.to national trade subject reports

Orientation
10.Addendum not completed response :

-College: St peace college and instituts Afric police.
-completed by : tshingombe tshitadi
- designation:
-Section /output planned activity//report///corrective mesure//// targate date completed..

--sect: workplacement ,student and lecturer.

-Planni g output , activities/verification minimum//evidence///responsible office design////activi output completed/////activities output not completed ///////target date for completion
-Program in renewable energy offer/enrollment programmation
- college WP student adhere // update college policy .
- process in place network identify industry, action plan ,strategy plan

National Treasury EMail Disclaimer

For inquiries refer to case **Incident # 1579995** as your reference number

This is a system generated e-mail and is for confirmation purpose only.

Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Frida excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

t

CSD Enquiry

Inbox

CS

csd@treasury.gov.za Mon, Aug 21, 8:59 AM (6 days ago)

to me

Good day

We acknowledge receipt of your email however, there is no detailed enquiry as to how you would like us to assist you.

Please advise how we can be off assistance.

Our service is also available telephonically on 012 406 9222 and operates from Monday to Friday, excluding public holidays from 08:00am to 16:30pm

Regards
Thenjiwe

Customer Service Representative
CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://www.csd.gov.za

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National Treasury EMail Disclaimer

t

tshingombe fiston Sat, Aug 26, 11:35 AM (23 hours ago)

Thank you for your response.

t

tshingombe fiston <tshingombefiston@gmail.com> Sat, Aug 26, 12:42 PM (21 hours ago)

to csd

thank u i need for you to contact department for accounting bider amount sale treasure stationary education value award diplomat tenderednational education bank rsa value book order project presented in your department

t

Incident logged on 2023/08/20 10:57:26 AM (UTC 02:00) - Africa/Johannesburg; was resolved on 2023/08/21 8:59:56 AM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za Mon, Aug 21, 9:00 AM (6 days ago)

to me

Dear tshingombefiston tshingombefiston,

We are committed to providing you with an EXCELLENT CUSTOMER SERVICE experience. We would like your feedback about the manner in which we handled your query/request.
Click here to fill out survey

Incident# 1579995 has been resolved:

Resolution

Kindly refer to the email send from csd@treasury.gov.za

Incident #	**1579995**
Summary:	Following up on Issue / Query
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	5
Status:	Resolved
Category:	Following up on Issue / Query
Resolved On:	2023/08/21 8:59:56 AM (UTC 02:00) - Afr

Description

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not expect. When in doubt, please contact the ICT Service Desk.

On Fri, Aug 18, 2023 at 4:48 PM TSHINGOMBEKB TSHITADI > wrote:
DHET , TVET /
college nated exam plan college

-Teach and learning plan 2022.
Lecture , dhet an St peace college internal external learner
Portofilio textbook.
- part 1 framework and conceptual underpinning of plan .
1. Purpose of the plan:
Planing examination national trade examination term and Semmester in college framework ,mo
evaluation test 1,2exercise book learning faculties diploma national coverage time table allocati
electrical and engineering college peer assessment,self assessment and group assignment subt
institut police engineering institute , qualifications implementation n diplomat saqa frame work
trade test practical .
- assignment class work internal assessment and external Assessment college nated technical vo
College,training college , coverage internal assessment.problem based instituts engineering and
evidence.
Coverage engineering police and traffic police engineering, subject.lecuture teach and learner .
2.Aim of plan : vision college and mission college and instituts examination subject ,basic advanc
Engineering electrical mission ,planing school disciplinary area circulum assessment police depar
Input output policy orientation guideline learner college must design engineer,and analyse disco
examination policy ,and saqa policy must meet. Criteria examinator planing circulum.
3. Objective of the plant: the exams inationa national trade department and internal external ex
objectivity learner to qualify and learner the end of examination should be able to correct to imp
and restitution faculties eny criteria to improved to take measurements in different ways of eng
4.Conceptual underpinning of plan
Lecture and learner planing course class model design ,module ,week completed exercise book.
Framework regulatority. Engineering studies business Engineering location

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studies business diplomat internal diplomat was record report certificate years ,completed scale
homework record years assessment completed filing Portofilio evidence topics coverage lecture
assessment and peer assessment critical objectivity learner delivery ,lecture anual report princip
examination external. Statement of results for registration attandance regularity or irregularitirs
learner theory expiremental and practical for n diplomat studies business engineering n 1,2,3,4,
professor doctoral work textbook and class work reading and professional orientation vocationa
subjects and Engineering electrical subjects , College St peace policy guidelines for Poe s works y
.-6 Key delivery area : in the plan.
Statement and certificate coverage compare marks years college and instituts and test class wor
statement criteria plan module 3 month Engineering electrical subjects research.

-7 the embededness of the teaching and learning plan in college strategy and operationel:, resea
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Assessment completed years methodology criteria research textbook learner.
-9 reviews and adaptation of the plan in successive, the planing submitted on internal and exter
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Time table orientation principal: circulum Assessment evaluation design engineering electrical fa
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job circulum years design development system ,subject engineering electrical and information to
national trade , subject reports

Orientation
10.Addendum not completed response :

-College: St peace college and instituts Afric police.
-completed by : tshingombe tshitadi
- designation:
-Section /output planned activity//report///corrective mesure//// targate date completed..

--sect: workplacement ,student and lecturer.

-Planni g output , activities/verification minimum//evidence///responsible office design////activi
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-Program in renewable energy offer/enrollment programmation
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National Treasury EMail Disclaimer

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Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Friday, excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222

csd@treasury.gov.za
https://secure.csd.gov.za/

t

ncident logged on 2023/08/20 10:57:26 AM (UTC 02:00) - Africa/Johannesburg; was resolved on 2023/08/21 8:59:56 AM (UTC 02:00) - Africa/Johannesburg

Inbox

cs

csd@treasury.gov.za Mon, Aug 21, 9:00 AM (6 days ago)

to me

Dear tshingombefiston tshingombefiston,

We are committed to providing you with an EXCELLENT CUSTOMER SERVICE experience. We would like your feedback about the manner in which we handled your query/request.
Click here to fill out survey

Incident# 1579995 has been resolved:

Resolution

Kindly refer to the email send from csd@treasury.gov.za

Incident #	**1579995**
Summary:	Following up on Issue / Query
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	5
Status:	Resolved
Category:	Following up on Issue / Query
Resolved On:	2023/08/21 8:59:56 AM (UTC 02:00) - Afr

Description

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not expect. When in doubt, please contact the ICT Service Desk.

On Fri, Aug 18, 2023 at 4:48 PM TSHINGOMBEKB TSHITADI > wrote:
DHET , TVET /
college nated exam plan college
-Teach and learning plan 2022.
Lecture , dhet an St peace college internal external learner
Portofilio textbook.
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trade test practical .
- assignment class work internal assessment and external Assessment college nated technical vo
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Coverage engineering police and traffic police engineering, subject.lecuture teach and learner .
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Engineering electrical mission ,planing school disciplinary area circulum assessment police depar
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3. Objective of the plant: the exams inationa national trade department and internal external ex
objectivity learner to qualify and learner the end of examination should be able to correct to imp
and restitution faculties eny criteria to improved to take measurements in different ways of eng
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Lecture and learner planing course class model design ,module ,week completed exercise book.
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professor doctoral work textbook and class work reading and professional orientation vocationa
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statement criteria plan module 3 month Engineering electrical subjects research.

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Time table orientation principal: circulum Assessment evaluation design engineering electrical fa
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Orientation
10.Addendum not completed response :

-College: St peace college and instituts Afric police.
-completed by : tshingombe tshitadi
- designation:
-Section /output planned activity//report///corrective mesure//// targate date completed..

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-Planni g output , activities/verification minimum//evidence///responsible office design////activi
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- college WP student adhere // update college policy .
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National Treasury EMail Disclaimer

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Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Friday, excluding public holidays from 08:00am to 16:00pm

Regards

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+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

t

This is to confirm that an incident was logged On: 2023/08/26 12:39:22 PM (UTC 02:00) - Africa/Johannesburg

Inbox

cs

csd@treasury.gov.za Sat, Aug 26, 12:39 PM (22 hours ago)

to me

Dear tshingombefiston tshingombefiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**1588212**
Summary:	Re: Dhet ,saqa,qcto ,scope teach learner
Customer Name:	tshingombefiston tshingombefiston
Location:	

Priority:	3
Status:	Logged
Category:	

Description

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On Fri, Aug 18, 2023 at 4:48 PM TSHINGOMBEKB TSHITADI > wrote:
DHET , TVET /
college nated exam plan college
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- assignment class work internal assessment and external Assessment college nated technical vocational and technical College,training college , coverage internal assessment.problem based instituts engineering and instituts police Portofilio evidence.
Coverage engineering police and traffic police engineering, subject.lecuture teach and learner .
2.Aim of plan : vision college and mission college and instituts examination subject ,basic advanc research and filling Engineering electrical mission ,planing school disciplinary area circulum assessment police department
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3. Objective of the plant: the exams inationa national trade department and internal external examiner assignment objectivity learner to qualify and learner the end of examination should be able to correct to implement to labal to retain and restitution faculties eny criteria to improved t take measurements in different ways of engineering electrical.
4.Conceptual underpinning of plan
Lecture and learner planing course class model design ,module ,week completed exercise

book.time allocation:
Framework regulatority. Engineering studies business Engineering location

5.Underpinning philosophy for delivery of quality teach Ong and learning in TVET college.
Teaching .: Report self ast and Peet assessment St peace college internal external term was 3 month qualify Engineering studies business diplomat internal diplomat was record report certificate years ,completed scale internal test class work homework record years assessment completed filing Portofilio evidence topics coverage lecture note and learner self assessment an peer assessment critical objectivity learner delivery ,lecture anual report principal and rectorat examination external. Statement of results for registration attandance regularity or irregularitirs learner report process learner theory expiremental and practical for n diplomat studies business engineering n 1,2,3,4,5,6 years lecture and professor doctoral work textbook and class work reading and professional orientation vocational examination trade subjects and Engineering electrical subjects , College St peace policy guidelines for Poe s works years memorendum exam.
.-6 Key delivery area : in the plan.
Statement and certificate coverage compare marks years college and instituts and test class work40%, 60% exam statement criteria plan module 3 month Engineering electrical subjects research.

-7 the embededness of the teaching and learning plan in college strategy and operationel:, research in college and instituts focused examin evaluation was undercover lecture weekend an learner weekend,
-8 Implementation and monitoring of the teaching and learning plan topic ,trade engineering national work research Assessment completed years methodology criteria research textbook learner.
-9 reviews and adaptation of the plan in successive, the planing submitted on internal and exterr ast learner and teacher nated ,seta engineering faculty St peace College completed time table planing, completed
Time table orientation principal: circulum Assessment evaluation design engineering electrical faculty engineering time table learner policing and college operationel time table period movement time morning to afternoon daily weekly move job circulum years design developmen system ,subject engineering electrical and information to. Business Engineering.to national trade subject reports

Orientation
10.Addendum not completed response :

-College: St peace college and instituts Afric police.
-completed by : tshingombe tshitadi
- designation:

-Section /output planned activity//report///corrective mesure//// targate date completed..

--sect: workplacement ,student and lecturer.

-Planni g output , activities/verification minimum//evidence///responsible office design////activi
output completed/////activities output not completed ///////target date for completion
-Program in renewable energy offer/enrollment programmation
- college WP student adhere // update college policy .
- process in place network identify industry, action plan ,strategy plan

National Treasury EMail Disclaimer

For inquiries refer to case **Incident # 1588212** as your reference number

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excluding public holidays from 08:00am to 16:00pm

Regards

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csd@treasury.gov.za
https://secure.csd.gov.za/

t

This is to confirm that an incident was logged On: 2023/08/26 12:43:18 PM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za Sat, Aug 26, 12:43 PM (22 hours ago)

to me

Dear tshingombefiston tshingombefiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**1588213**
Summary:	Re: CSD Enquiry
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	3
Status:	Logged
Category:	

Description

Important: This email originated from an external sender. Please do not click on email links or open attachments you did not expect. When in doubt, please contact the ICT Service Desk.

thank u i need for you to contact department for accounting bider amount sale treasure stationa education value award diplomat tenderednational education bank rsa value book order project presented in your department

On Mon, Aug 21, 2023 at 8:59 AM > wrote:
Good day

We acknowledge receipt of your email however, there is no detailed enquiry as to how you wou like us to assist you.

Please advise how we can be off assistance.

Our service is also available telephonically on 012 406 9222 and operates from Monday to Friday excluding public holidays from 08:00am to 16:30pm

Regards
Thenjiwe

Customer Service Representative
CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://www.csd.gov.za

[cid:18a316e434cccc2cef61] [cid:18a316e434dccc2cef72]

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National Treasury EMail Disclaimer

For inquiries refer to case **Incident # 1588213** as your reference number

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Regards

CSD Contact Centre

+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

t

This is to confirm that an incident was logged On: 2023/08/26 1:29:22 PM (UTC 02:00) - Africa/Johannesburg

Inbox

cs

csd@treasury.gov.za Sat, Aug 26, 1:29 PM (21 hours ago)

to me

Dear tshingombefiston tshingombefiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**1588217**
Summary:	Re: Complaint pension fund
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	3
Status:	Logged
Category:	

Description

Important: This email originated from an external sender. Please do not click on email links or open attachments you did not expect. When in doubt, please contact the ICT Service Desk.

On Sat, Aug 26, 2023 at 1:26 PM tshingombe fiston > wrote:

On Sun, Jun 4, 2023 at 2:02 PM TSHINGOMBEKB TSHITADI > wrote:
Complaint

On Sun, 04 Jun 2023, 08:16 TSHINGOMBEKB TSHITADI, > wrote:
Nogada guarding services vs tshingombe Tshitadi
P.o.box @0396, /
Falls 1522,fourteenth avenue,northemeadsauare office block,benoni, 1501, Ccma benonie jhb , Witbank
Telephone 2711849/19/15/33,
Facsimiles+271184984730.
V.a.t n: 4150224121.
Cc No,2005/124132/23.
P.sira no:135842
Info@nogada.co.za.
Nogada sa review employee
Edenvale
_____
Job title : customer trolley assistant parking career
, location. Witbank..Ccma labour court jhb...psira pssf
-Work life balance: R000
-pay benefits:R000
-job security advancement.
-management culture
Good condition work .day night shift .
-area management pro cons plenty,yes,no
Poor .
Non productive ,site supervisor home joined the company
Overall rating rating
Question wath are working

-cvs employers ,job ,submit
Nogada security area nagada R2000.R5Ooo month compagny base
Securite area vehicle for 3 month car allowance

Pay query.

Guard name: tshingombe Tshitadi
Position in compagny: security officer car guard number...
Guard Ccma labour outcome
Site name:savewas Witbank,,
Date: outcomes court Ccma
Time:
Vs
Service transcript
Vat arbour square cnr Juta street ground street Braamfontein 2001,
Tel:O1133912/0794335.
Mazanzi@telecom.co.
Mzanzibusi ESS.
Vat no:4190278988
Invoice 1860
Date:11/07/2020
Customer Vat.
To :Tshitadi tshingombe
Email: tshingombe kb@gmail.com
Unit 11,1, description 1-wee qwasa
Tshingombe...
Rate:R38,00 ,,amount 418,00
Admi :R250,00,,a R,2500
Parties: tshingombe t /nogada security
Case no :jr 2461/2015
Total:R668,00
15%vat R100,20
Deposit,Total due ,518,20,,
Banking detai stand , business count ,branch springs..
Bid estimate quotation,01-07-2020/ jr 2461-2015 ../ JA/2019
Bid closed:

-Labour court court order : digital
Tax statement

--Labour uif coid dol:case number
Sars : estate query attorney legal
Court order :

-Cpic : property .court order close cooperation..

Translate . termination

Beee dti

-psira pssf Court order enforcement
Complaint .

Seta Teta sasseta : skill development order grantees :

On Tue, 30 May 2023, 14:29 TSHINGOMBEKB TSHITADI, > wrote:
T.tshingombe .
Good day dear I need your assistance above of re completed complain investigation verification process.
_____
.

National Treasury EMail Disclaimer

For inquiries refer to case **Incident # 1588217** as your reference number

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Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Friday excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

t

This is to confirm that an incident was logged On: 2023/08/26 1:35:35 PM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za Sat, Aug 26, 1:35 PM (21 hours ago)

to me

Dear tshingombefiston tshingombefiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**1588218**
Summary:	Re: Complaint pension fund
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	3
Status:	Logged
Category:	

Description

Important: This email originated from an external sender. Please do not click on email links or open attachments you did not expect. When in doubt, please contact the ICT Service Desk.

On Sun, Jun 4, 2023 at 2:02 PM TSHINGOMBEKB TSHITADI > wrote:
Complaint

On Sun, 04 Jun 2023, 08:16 TSHINGOMBEKB TSHITADI, > wrote:
Nogada guarding services vs tshingombe Tshitadi
P.o.box @0396, /
Falls 1522,fourteenth avenue,northemeadsauare office block,benoni, 1501, Ccma benonie jhb , Witbank
Telephone 2711849/19/15/33,
Facsimiles+271184984730.
V.a.t n: 4150224121.
Cc No,2005/124132/23.
P.sira no:135842
Info@nogada.co.za.
Nogada sa review employee
Edenvale
_____
Job title : customer trolley assistant parking career
, location. Witbank..Ccma labour court jhb...psira pssf
-Work life balance: R000
-pay benefits:R000
-job security advancement.
-management culture
Good condition work .day night shift .
-area management pro cons plenty,yes,no
Poor .
Non productive ,site supervisor home joined the company
Overall rating rating
Question wath are working

-cvs employers ,job ,submit
Nogada security area nagada R2000.R5Ooo month compagny base
Securite area vehicle for 3 month car allowance

Pay query.
Guard name: tshingombe Tshitadi
Position in compagny: security officer car guard number...
Guard Ccma labour outcome
Site name:savewas Witbank,,
Date: outcomes court Ccma

Time:
Vs
Service transcript
Vat arbour square cnr Juta street ground street Braamfontein 2001,
Tel:O1133912/0794335.
Mazanzi@telecom.co.
Mzanzibusi ESS.
Vat no:4190278988
Invoice 1860
Date:11/07/2020
Customer Vat.
To :Tshitadi tshingombe
Email: tshingombe kb@gmail.com
Unit 11,1, description 1-wee qwasa
Tshingombe...
Rate:R38,00 ,,amount 418,00
Admi :R250,00,,a R,2500
Parties: tshingombe t /nogada security
Case no :jr 2461/2015
Total:R668,00
15%vat R100,20
Deposit,Total due ,518,20,,
Banking detai stand , business count ,branch springs..
Bid estimate quotation,01-07-2020/ jr 2461-2015 ../ JA/2019
Bid closed:

-Labour court court order : digital
Tax statement

--Labour uif coid dol:case number
Sars : estate query attorney legal
Court order :

-Cpic : property .court order close cooperation..
Translate . termination

Beee dti

-psira pssf Court order enforcement

Complaint .

Seta Teta sasseta : skill development order grantees :

On Tue, 30 May 2023, 14:29 TSHINGOMBEKB TSHITADI, > wrote:
T.tshingombe .
Good day dear I need your assistance above of re completed complain investigation verification process.
_____
.

National Treasury EMail Disclaimer

For inquiries refer to case **Incident # 1588218** as your reference number

This is a system generated e-mail and is for confirmation purpose only.

Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Friday excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

Incident logged on 2023/08/26 1:35:35 PM (UTC 02:00) - Africa/Johannesburg; was resolved on 2023/08/28 9:48:53 AM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za Mon, Aug 28, 9:50 AM

to me

Dear tshingombefiston tshingombefiston,

We are committed to providing you with an EXCELLENT CUSTOMER SERVICE experience. We would like your feedback about the manner in which we handled your query/request.

Click here to fill out survey

Incident# 1588218 has been resolved:

Resolution
Kindly refer to the email sent from csd@treasury.gov.za.

Incident #	1588218
Summary:	Complaint pension fund
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	5
Status:	Resolved

Category:	Supplier Number Enquiry
Resolved On:	2023/08/28 9:48:53 AM (UTC 02:00) - Afr

Description

Important: This email originated from an external sender. Please do not click on email links or op
not expect. When in doubt, please contact the ICT Service Desk.

On Sun, Jun 4, 2023 at 2:02 PM TSHINGOMBEKB TSHITADI > wrote:
Complaint

On Sun, 04 Jun 2023, 08:16 TSHINGOMBEKB TSHITADI, > wrote:
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Telephone 2711849/19/15/33,
Facsimiles+271184984730.
V.a.t n: 4150224121.
Cc No,2005/124132/23.
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Info@nogada.co.za.
Nogada sa review employee
Edenvale
_____
Job title : customer trolley assistant parking career
, location. Witbank..Ccma labour court jhb...psira pssf
-Work life balance: R000
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Poor .
Non productive ,site supervisor home joined the company
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-cvs employers ,job ,submit
Nogada security area nagada R2000.R5Ooo month compagny base
Securite area vehicle for 3 month car allowance

Pay query.
Guard name: tshingombe Tshitadi
Position in compagny: security officer car guard number...
Guard Ccma labour outcome
Site name:savewas Witbank,,
Date: outcomes court Ccma
Time:
Vs
Service transcript
Vat arbour square cnr Juta street ground street Braamfontein 2001,
Tel:O1133912/0794335.
Mazanzi@telecom.co.
Mzanzibusi ESS.
Vat no:4190278988
Invoice 1860
Date:11/07/2020
Customer Vat.
To :Tshitadi tshingombe
Email: tshingombe kb@gmail.com
Unit 11,1, description 1-wee qwasa
Tshingombe...
Rate:R38,00 ,,amount 418,00
Admi :R250,00,,a R,2500
Parties: tshingombe t /nogada security
Case no :jr 2461/2015
Total:R668,00
15%vat R100,20
Deposit,Total due ,518,20,,
Banking detai stand , business count ,branch springs..
Bid estimate quotation,01-07-2020/ jr 2461-2015 ../ JA/2019
Bid closed:

-Labour court court order : digital

Tax statement

--Labour uif coid dol:case number
Sars : estate query attorney legal
Court order :

-Cpic : property .court order close cooperation..
Translate . termination

Beee dti

-psira pssf Court order enforcement
Complaint .

Seta Teta sasseta : skill development order grantees :

On Tue, 30 May 2023, 14:29 TSHINGOMBEKB TSHITADI, > wrote:
T.tshingombe .
Good day dear I need your assistance above of re completed complain investigation verification
_____
.

National Treasury EMail Disclaimer

For inquiries refer to case Incident # 1588218 as your reference number

This is a system generated e-mail and is for confirmation purpose only.

Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Friday, excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

t

Incident logged on 2023/08/26 1:29:22 PM (UTC 02:00) - Africa/Johannesburg; was resolved on 2023/08/28 9:49:51 AM (UTC 02:00) - Africa/Johannesburg

Inbox

cs

csd@treasury.gov.za Mon, Aug 28, 9:51 AM

to me

Dear tshingombefiston tshingombefiston,

We are committed to providing you with an EXCELLENT CUSTOMER SERVICE experience. We would like your feedback about the manner in which we handled your query/request.

Click here to fill out survey

Incident# 1588217 has been resolved:

Resolution
Kindly refer to incident number 1588218.

Incident #	1588217
Summary:	Re: Complaint pension fund
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	5
Status:	Resolved
Category:	Supplier Number Enquiry
Resolved On:	2023/08/28 9:49:51 AM (UTC 02:00) - Afr

Description

Important: This email originated from an external sender. Please do not click on email links or op
not expect. When in doubt, please contact the ICT Service Desk.

On Sat, Aug 26, 2023 at 1:26 PM tshingombe fiston > wrote:

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P.sira no:135842
Info@nogada.co.za.
Nogada sa review employee
Edenvale

_____
Job title : customer trolley assistant parking career
, location. Witbank..Ccma labour court jhb...psira pssf
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Pay query.
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Guard Ccma labour outcome
Site name:savewas Witbank,,
Date: outcomes court Ccma
Time:
Vs
Service transcript
Vat arbour square cnr Juta street ground street Braamfontein 2001,
Tel:O1133912/0794335.
Mazanzi@telecom.co.
Mzanzibusi ESS.
Vat no:4190278988
Invoice 1860
Date:11/07/2020
Customer Vat.
To :Tshitadi tshingombe
Email: tshingombe kb@gmail.com

Unit 11,1, description 1-wee qwasa
Tshingombe...
Rate:R38,00 ,,amount 418,00
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Parties: tshingombe t /nogada security
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Tax statement

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Sars : estate query attorney legal
Court order :

-Cpic : property .court order close cooperation..
Translate . termination

Beee dti

-psira pssf Court order enforcement
Complaint .

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Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

t

Incident logged on 2023/08/26 1:29:22 PM (UTC 02:00) - Africa/Johannesburg; was resolved on 2023/08/28 9:49:51 AM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za Mon, Aug 28, 9:51 AM

to me

Dear tshingombefiston tshingombefiston,

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Click here to fill out survey

Incident# 1588217 has been resolved:

Resolution
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Incident #	1588217
Summary:	Re: Complaint pension fund
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	5
Status:	Resolved
Category:	Supplier Number Enquiry
Resolved On:	2023/08/28 9:49:51 AM (UTC 02:00) - Afr

Description
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Nogada sa review employee
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Tel:O1133912/0794335.
Mazanzi@telecom.co.
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Vat no:4190278988
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Total:R668,00
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Bid estimate quotation,01-07-2020/ jr 2461-2015 ../ JA/2019
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-Labour court court order : digital
Tax statement

--Labour uif coid dol:case number
Sars : estate query attorney legal
Court order :

-Cpic : property .court order close cooperation..
Translate . termination

Beee dti

-psira pssf Court order enforcement

Complaint .

Seta Teta sasseta : skill development order grantees :

On Tue, 30 May 2023, 14:29 TSHINGOMBEKB TSHITADI, > wrote:
T.tshingombe .
Good day dear I need your assistance above of re completed complain investigation verification
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National Treasury EMail Disclaimer

For inquiries refer to case Incident # 1588217 as your reference number

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Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Friday, excluding public holidays from 08:00am to 16:00pm

Regards

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+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

Incident logged on 2023/08/28 7:45:59 AM (UTC 02:00) - Africa/Johannesburg; was resolved on 2023/08/28 10:23:57 AM (UTC 02:00) - Africa/Johannesburg

Inbox

csd@treasury.gov.za Mon, Aug 28, 10:25 AM

to me

Dear tshingombefiston tshingombefiston,

We are committed to providing you with an EXCELLENT CUSTOMER SERVICE experience. We would like your feedback about the manner in which we handled your query/request.

Click here to fill out survey

Incident# 1588282 has been resolved:

Resolution
Resolved according to Incident: 1588218

Incident #	1588282
Summary:	Re: CCMA Online Submission: EGAEK0223
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	5
Status:	Resolved
Category:	Following up on Issue / Query
Resolved On:	2023/08/28 10:23:57 AM (UTC 02:00) - Af

Description

Important: This email originated from an external sender. Please do not click on email links or op
not expect. When in doubt, please contact the ICT Service Desk.

On Sun, 27 Aug 2023, 14:46 TSHINGOMBEKB TSHITADI, > wrote:

On Tue, 10 Jan 2023, 07:41 , > wrote:
Dear Respondent,

Please note that a submission has been made online to the Commission for Conciliation, Mediat
in which you have been named as the other party. The details of the case are summarised in the
by the referring party. Please quote the online reference number EGAEK0223008224 for all futu

Note that the online reference number is not the actual case number for your dispute. The CCM
referral form and allocate a case number to it.

Kind Regards

CCMA Online Admin Team
IMVUSELELO - THE REVIVAL
I am because you are

This is an automatically generated email and should not be responded to.The information conta
privileged and confidential, and may contain proprietary and/or personal information. It is mear
recipient. Access to this email by anyone else is unauthorised. If you are not the intended recipie
email or the information contained therein (including disclosure, copying, distribution, storage)
omitted in reliance on this, is prohibited and may be unlawful.

Please forward all correspondence and any further requests for service to DLEKURegion@CCMA

National Treasury EMail Disclaimer

For inquiries refer to case Incident # 1588282 as your reference number

This is a system generated e-mail and is for confirmation purpose only.

Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Friday, excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

t

Incident logged on 2023/08/26 12:43:18 PM (UTC 02:00) - Africa/Johannesburg; was resolved on 2023/08/28 10:24:19 AM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za Mon, Aug 28, 10:25 AM

to me

Dear tshingombefiston tshingombefiston,

We are committed to providing you with an EXCELLENT CUSTOMER SERVICE experience. We would like your feedback about the manner in which we handled your query/request.

Click here to fill out survey

Incident# 1588213 has been resolved:

Resolution

Resolved according to Incident: 1588218

Incident #	1588213
Summary:	Re: CSD Enquiry
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	5
Status:	Resolved
Category:	Following up on Issue / Query
Resolved On:	2023/08/28 10:24:19 AM (UTC 02:00) - Af

Description

Important: This email originated from an external sender. Please do not click on email links or op
not expect. When in doubt, please contact the ICT Service Desk.

thank u i need for you to contact department for accounting bider amount sale treasure station
diplomat tenderednational education bank rsa value book order project presented in your depa

On Mon, Aug 21, 2023 at 8:59 AM > wrote:
Good day

We acknowledge receipt of your email however, there is no detailed enquiry as to how you wou

Please advise how we can be off assistance.

Our service is also available telephonically on 012 406 9222 and operates from Monday to Frida
from 08:00am to 16:30pm

Regards
Thenjiwe

Customer Service Representative
CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://www.csd.gov.za

[cid:18a316e434cccc2cef61] [cid:18a316e434dccc2cef72]

Disclaimer: The user must safeguard and keep confidential his or her CSD username and passwo
the CSD mobile app should note that their CSD username and other user related information wil
device memory of the mobile device and that this information will be encrypted. The National Tı
to a supplier or an organ of state for any loss or damage as a result of unauthorized access to su
information of the organ of state on the CSD. The National Treasury shall not be liable for any lo
any misuse of supplier information on the CSD by any person.

National Treasury EMail Disclaimer

For inquiries refer to case Incident # 1588213 as your reference number

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Regards

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+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

t

Incident logged on 2023/08/26 12:39:22 PM (UTC 02:00) - Africa/Johannesburg; was resolved on 2023/08/28 10:24:32 AM (UTC 02:00) - Africa/Johannesburg

Inbox

cs

csd@treasury.gov.za Mon, Aug 28, 10:25 AM

to me

Dear tshingombefiston tshingombefiston,

We are committed to providing you with an EXCELLENT CUSTOMER SERVICE experience. We would like your feedback about the manner in which we handled your query/request.

Click here to fill out survey

Incident# 1588212 has been resolved:

Resolution
Resolved according to Incident: 1588218

Incident #	1588212
Summary:	Re: Dhet ,saqa,qcto ,scope teach learner
Customer Name:	tshingombefiston tshingombefiston
Location:	

Priority:	5
Status:	Resolved
Category:	Following up on Issue / Query
Resolved On:	2023/08/28 10:24:32 AM (UTC 02:00) - Af

Description

Important: This email originated from an external sender. Please do not click on email links or op
not expect. When in doubt, please contact the ICT Service Desk.

On Fri, Aug 18, 2023 at 4:48 PM TSHINGOMBEKB TSHITADI > wrote:
DHET , TVET /
college nated exam plan college
-Teach and learning plan 2022.
Lecture , dhet an St peace college internal external learner
Portofilio textbook.
- part 1 framework and conceptual underpinning of plan .
1. Purpose of the plan:
Planing examination national trade examination term and Semmester in college framework ,mo
evaluation test 1,2exercise book learning faculties diploma national coverage time table allocati
electrical and engineering college peer assessment,self assessment and group assignment subt
institut police engineering institute , qualifications implementation n diplomat saqa frame work
trade test practical .
- assignment class work internal assessment and external Assessment college nated technical vo
College,training college , coverage internal assessment.problem based instituts engineering and
evidence.
Coverage engineering police and traffic police engineering, subject.lecuture teach and learner .
2.Aim of plan : vision college and mission college and instituts examination subject ,basic advanc
Engineering electrical mission ,planing school disciplinary area circulum assessment police depar
Input output policy orientation guideline learner college must design engineer,and analyse disco
examination policy ,and saqa policy must meet. Criteria examinator planing circulum.
3. Objective of the plant: the exams inationa national trade department and internal external ex
objectivity learner to qualify and learner the end of examination should be able to correct to imp
and restitution faculties eny criteria to improved to take measurements in different ways of eng
4.Conceptual underpinning of plan
Lecture and learner planing course class model design ,module ,week completed exercise book.

Framework regulatority. Engineering studies business Engineering location

5.Underpinning philosophy for delivery of quality teach Ong and learning in TVET college.
Teaching .: Report self ast and Peet assessment St peace college internal external term was 3 m
studies business diplomat internal diplomat was record report certificate years ,completed scale
homework record years assessment completed filing Portofilio evidence topics coverage lecture
assessment and peer assessment critical objectivity learner delivery ,lecture anual report princip
examination external. Statement of results for registration attandance regularity or irregularitirs
learner theory expiremental and practical for n diplomat studies business engineering n 1,2,3,4,
professor doctoral work textbook and class work reading and professional orientation vocationa
subjects and Engineering electrical subjects , College St peace policy guidelines for Poe s works y
.-6 Key delivery area : in the plan.
Statement and certificate coverage compare marks years college and instituts and test class wor
statement criteria plan module 3 month Engineering electrical subjects research.

-7 the embededness of the teaching and learning plan in college strategy and operationel:, resea
focused examin evaluation was undercover lecture weekend and learner weekend,
-8 Implementation and monitoring of the teaching and learning plan topic ,trade engineering na
Assessment completed years methodology criteria research textbook learner.
-9 reviews and adaptation of the plan in successive, the planing submitted on internal and exter
nated ,seta engineering faculty St peace College completed time table planing, completed
Time table orientation principal: circulum Assessment evaluation design engineering electrical fa
table learner policing and college operationel time table period movement time morning to afte
job circulum years design development system ,subject engineering electrical and information t
national trade , subject reports

Orientation
10.Addendum not completed response :

-College: St peace college and instituts Afric police.
-completed by : tshingombe tshitadi
- designation:
-Section /output planned activity//report///corrective mesure//// targate date completed..

--sect: workplacement ,student and lecturer.

-Planni g output , activities/verification minimum//evidence///responsible office design////activi
completed/////activities output not completed ///////target date for completion
-Program in renewable energy offer/enrollment programmation
- college WP student adhere // update college policy .

- process in place network identify industry, action plan ,strategy plan

National Treasury EMail Disclaimer

For inquiries refer to case Incident # 1588212 as your reference number

This is a system generated e-mail and is for confirmation purpose only.

Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Friday, excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

t

Incident logged on 2023/09/21 4:26:44 PM (UTC 02:00) - Africa/Johannesburg; was resolved on 2023/09/22 9:05:26 AM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za 9:06 AM (3 hours ago)

to me

Dear tshingombefiston tshingombefiston,

We are committed to providing you with an EXCELLENT CUSTOMER SERVICE experience. We would like your feedback about the manner in which we handled your query/request.

Click here to fill out survey

Incident# 1613470 has been resolved:

Resolution
Refer to incident 1613503 with response.

Incident #	1613470
Summary:	CSD Registration Process
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	5
Status:	Resolved
Category:	CSD Registration Process
Resolved On:	2023/09/22 9:05:26 AM (UTC 02:00) - Afr

Description
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On Wed, Sep 20, 2023 at 5:31 PM tshingombe fiston > wrote:

partment of science and innovation socio economic development,
-1 .programme administration technology innovation international cooperation
Gov , city power and St peace college
Programe, exposition science

-2.programme research development support :
St peace college lecture and learner development under planing. Department high Education vs research resolved time table examination Assessment police , Portofilio documents systeme inte

-2.1. purpose : inovation practical and theoretical. science and technology science national trade trading examination and qualifition framework national diploma n engineering and council trade inovation system outcomes empower system subject entry phase learning and lecture teach scie technology Assessment police ,and Engineering assessment trade machine and trade control sys system controle evaluation system
2.1.2 knowledge: inovation practical and theoretical trade technology electrical engineering Elec value are recreation orientation maximum,value tax , return studies and
Examin electrotechnology engineering time table assessment
Completed research linearise system technology value entry lecture exam nated vs saqa vs qcto electrotechnology power fundamental job duty job maximum,job value minimum trade operatic system,
-Job duty cycle system value : learner lecture framework qualifition and occupation trade job va maximum fiscality minimum technology components system : sciences natural system investigat agreement value job trade module,task minimum ,task minimum service require trading sectors electrotechnology trading components
Value financial tax system:
2.2.3: strategies: strategies phasing module tasking circulum system implentation levels grading objectivity:
The trading lecture and learning system engineering science electrical subject and technology electrical ,electrotechnology ,education technology
System outcom , trading education technology systems power factor demand system education assignment power objectivity module task , maximize inventories psychopedagogie metric syste observations learner form test assessment assignment control tpm maintence meeting product

-1.2.3.4: development humain generation : system teach sector organisations technology rate va demand factor admnise value ask required report system value.
-1.2.5.component: trading lecture used campagny manufacture relate system Industrial Educati management system information ,education computing control system switch and material sup component manufacturers
Numerical time table framework regulatority Education trade relate handbook guideline informa

integrative system component handbook relate maintenance update , upgrade system
-1.2.6: basic scieny infractuture: implentation of research inovation mission equipment
College equipment framework theory practical lab workshop workplace implentation departmer

Inovation,tax incentives,,
Meeting request

-National energie regulatority of South Africa mandatory electricity piped , invitation me ministe

Meeting electrical conformance board design installer regulatority Cox competition b

Meeting salt .dmrg stick ,sale revenue npower plant fuel used national treasure sars department
ensure private sector participr in power generation ,
Meet national skill fund,, national research fund ,,
Visa permit

On Wed, 20 Sep 2023, 16:20 DSI-Notification, > wrote:

R&D Tax Incentive Login User Profile Confirmation

Good day

Your profile registration for the R&D Tax Incentive programme is still in progress.

Before we can conclude your registration process, please confirm that this email address is valid

To verify this email address, please click the link below to setup a password or copy and paste th

Link to e-mail address verification

This link will expire within 5 minutes.

Please do not reply to this email as replies to this message will be sent to an unmonitored mailb

Legal disclaimer: This email is intended solely for the use of the individual or entity to whom/wh
have received this email in error, please delete the email from your system. If you are not the in
notified that disclosing, copying, distributing or taking any action in reliance on the contents of t
prohibited.

Sincerely

Department of Science and Innovation

National Treasury EMail Disclaimer

For inquiries refer to case Incident # 1613470 as your reference number

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Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Friday, excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

Incident logged on 2023/09/21 6:06:54 PM (UTC 02:00) - Africa/Johannesburg; was resolved on 2023/09/22 9:01:49 AM (UTC 02:00) - Africa/Johannesburg

Inbox

csd@treasury.gov.za 9:06 AM (3 hours ago)

to me

Dear tshingombefiston tshingombefiston,

We are committed to providing you with an EXCELLENT CUSTOMER SERVICE experience. We would like your feedback about the manner in which we handled your query/request.

Click here to fill out survey

Incident# 1613508 has been resolved:

Resolution
Refer to incident 1613503 with response.

Incident #	1613508
Summary:	CSD Registration Process
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	5
Status:	Resolved
Category:	CSD Registration Process
Resolved On:	2023/09/22 9:01:49 AM (UTC 02:00) - Afr

Description
Important: This email originated from an external sender. Please do not click on email links or op not expect. When in doubt, please contact the ICT Service Desk.

On Thu, Sep 21, 2023 at 5:26 PM tshingombe fiston > wrote:
portfolio evidence

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+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

t

Incident logged on 2023/09/21 5:42:19 PM (UTC 02:00) - Africa/Johannesburg; was resolved on 2023/09/22 9:01:31 AM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za 9:02 AM (3 hours ago)

to me

Dear tshingombefiston tshingombefiston,

We are committed to providing you with an EXCELLENT CUSTOMER SERVICE experience. We would like your feedback about the manner in which we handled your query/request.

Click here to fill out survey

Incident# 1613503 has been resolved:

Resolution
Kindly refer to email sent from csd@treasury.gov.za

Incident #	1613503
Summary:	CSD Registration Process
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	5
Status:	Resolved
Category:	CSD Registration Process
Resolved On:	2023/09/22 9:01:31 AM (UTC 02:00) - Afr

Description
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[X]

department of science and innovation socio economic development,

-1 .programme administration technology innovation international cooperation
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-2.programme research development support :
St peace college lecture and learner development under planning. Department high Education v
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generation technology Assessment police ,and Engineering assessment trade machine and trade
project system control evaluation system
2.1.2 knowledge: innovation practical and theoretical trade technology electrical engineering Ele
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Examine electro technology engineering time table assessment
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-Job duty cycle system value : learner lecture framework qualifition and occupation trade job va
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agreement value job trade module,task minimum ,task minimum service require trading sectors
electrotechnology trading components
Value financial tax system:
2.2.3: strategies: strategies phasing module tasking curriculum system implantation levels gradir
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System outcome , trading education technology systems power factor demand system educatio
assignment power objectivity module task , maximize inventories psychopedagogie metric syste
observations learner form test assessment assignment control tpm maintence meeting product

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demand factor admnise value ask required report system value.
-1.2.5.component: trading lecture used company manufacture relate system Industrial Educatio
management system information ,education computing control system switch and material sup
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Numerical time table framework regulatory Education trade relate handbook guideline informat
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Meeting salt .dmrg stick ,sale revenue power plant fuel used national treasure sars department ensure private sector participr in power generation ,
Meet national skill fund,, national research fund ,,
Visa permit
[X]
[X]

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portfolio evidence

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Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za

https://secure.csd.gov.za/

t

CSD Registration Process

Inbox

CS

csd@treasury.gov.za 9:02 AM (3 hours ago)

to me

Good day Tshingombe

The Central Supplier Database is only reserved for the registration of the supplier's profiles wishing to have the business undertaken with the government. As such, nothing else besides the supplier profile registration or CSD related queries might be forwarded to this e mail address. If wishing to register, click on the below link:

www.csd.gov.za

You can then follow the guide below in order to register on the Central Supplier Database:

You are required to follow a two stage self-registration process:

STAGE 1: Create yourself as a CSD user

- Register your basic information on: CSD register

PASSWORD CRITERIA:

You need to have not less than 8 characters in all

You must have a capital letter e.g. K

You must have lower case letters e.g. ele

You must have a Special character e.g. @ or # or $ or %

You must have at least a number as well e.g. 1982

In full an example should be like this: Kele@1982

- Activate your account using the activate account link emailed to you; and
- Click on request OTP (one time pin) then enter the OTP sent via sms

STAGE 2: Complete supplier details

- Log in on: CSD Login;
- Click on "Accept" on the terms and conditions screen
- Click on "I Acknowledge" on the self-registration steps screen
- Click on "I Acknowledge" on the fraud screen
- Click on supplier details followed by add supplier

- Complete the Identification tab

- Complete the Industry Classification tab

Kindly select an industry that is the closest to the services your company provides.

- Click on supplier details
- Click on edit on your far right hand side
- Click on industry classification
- Click on “add/edit industry classification”
- Click on the small arrow on the left of the particular industry to expand the options
- Select the actual industry classification
- Click edit on the right on the row of the specific industry
- Drag the indicator to the right till it gives you 100%
- Then click save next to it
- Then save again at the bottom of the page

e.g.

..

- Complete the information on the Contacts tab

- Select the preferred method(s) of communication
- Add the telephone/fax/toll-free numbers where applicable
- Add the website address if applicable

- Complete the information on the Address tab

- Click “add address” tab
- Select “physical” on address type
- Add the physical address details
- If the physical address is the same as the postal address, tick all 4 check-boxes
- If the postal address is different from the physical address, click add address after saving the physical address
- Select postal address

- Add postal address details
- Click “save”

- Complete the Bank information

- Click on bank
- Click on add bank account
- Capture the Account Holder name as it appears on the Bank confirmation letter
- Request the OTP (One Time Pin) and capture it
- Click the save button

Kindly note that your banking details will be sent for verification and may take up to 4 business days to be completed, you will receive a response email once validation is complete.

- Complete the Tax information

- Click on supplier details
- Click on the edit icon
- Go to the tax tab, click on edit tax details

This is to confirm that an incident was logged On: 2023/09/21 6:06:54 PM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za Thu, Sep 21, 6:07 PM (18 hours ago)

to me

Dear tshingombefiston tshingombefiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**1613508**
Summary:	Re: portofolio document
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	3
Status:	Logged
Category:	

Description

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On Thu, Sep 21, 2023 at 5:26 PM tshingombe fiston > wrote:
portfolio evidence

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Regards

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Inbox

csd@treasury.gov.za Thu, Sep 21, 4:27 PM (19 hours ago)

to me

Dear tshingombefiston tshingombefiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	1613470
Summary:	Re: R&D Tax Incentive: Verify Email address
Customer Name:	tshingombefiston tshingombefiston
Location:	
Priority:	3
Status:	Logged
Category:	

Description

Important: This email originated from an external sender. Please do not click on email links or open attachments you did not expect. When in doubt, please contact the ICT Service Desk.

On Wed, Sep 20, 2023 at 5:31 PM tshingombe fiston > wrote:
partment of science and innovation socio economic development,
-1 .programme administration technology innovation international cooperation
Gov , city power and St peace college
Programe, exposition science

-2.programme research development support :
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-2.1. purpose : inovation practical and theoretical. science and technology science national trade factor outcome time table trading examination and qualifition framework national diploma n engineering and council trade sector authority , inovation system outcomes empower system subject entry phase learning and lecture teach science exhibition generation technology Assessment police ,and Engineering assessment trade machine and trade control system process project system controle evaluation system
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Examin electrotechnology engineering time table assessment
Completed research linearise system technology value entry lecture exam nated vs saqa vs qcto linearise system electrotechnology power fundamental job duty job maximum,job value minimu trade operational,task minim component system,
-Job duty cycle system value : learner lecture framework qualifition and occupation trade job val salary resource humain maximum fiscality minimum technology components system : sciences

natural system investigation design minimum agreement value job trade module,task minimum ,task minimum service require trading sectors and maximum sectoral electrotechnolog trading components
Value financial tax system:
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Meet national skill fund,, national research fund ,,
Visa permit

On Wed, 20 Sep 2023, 16:20 DSI-Notification, > wrote:

R&D Tax Incentive Login User Profile Confirmation

Good day

Your profile registration for the R&D Tax Incentive programme is still in progress.

Before we can conclude your registration process, please confirm that this email address is valid

To verify this email address, please click the link below to setup a password or copy and paste th
link into your browser:

Link to e-mail address verification

This link will expire within 5 minutes.

Please do not reply to this email as replies to this message will be sent to an unmonitored mailbo

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taking any action in reliance on the contents of this information is strictly prohibited.

Sincerely

Department of Science and Innovation

National Treasury EMail Disclaimer

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excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222

csd@treasury.gov.za
https://secure.csd.gov.za/

tshingombe fiston <tshingombefiston@gmail.com> Mon, May 22, 2:37 PM

to TSHINGOMBEKB

PDF] DEPARTMENT: SOUTH AFRICAN POLICE SERVICEUL ... - SAPS

www.saps.gov.za › services › bidthumbnail

23 Sept 2022 · APPOINTMENT OF CONTRACTOR FOR REPAIRS AND REPLACEMENT OF ROOF AT HAMMANSKRAAL POLICE. STATION IN GAUTENG PROVINCE.

[PDF] C1.2: Contract Data- (GCC (2004): 1st Edition - SAPS

www.saps.gov.za › services › bidthumbnail

4.8. Service, Maintenance and repairs - The successful Contractor shall carry out six (6) monthly services for the contract period, 30 months maintenance on the ...

[PDF] SATS 1286:2011 - SAPS

www.saps.gov.za › services › bidthumbnail

5.1 The procurement authority may require that the measurement of local content be verified.

The verification shall be conducted by: a) an accredited ...

[PDF] saps scm c 1.1: form of offer and acceptance

www.saps.gov.za › services › bidthumbnail

01 Jan 2015 · Service, Maintenance and Repairs - The successful Bidder shall carry out five (5) and six (6) monthly services for the contract period. Thirty (...

[PDF] Total - SAPS

www.saps.gov.za › services › bidthumbnail

quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to.

[PDF] C1.2: Contract Data- (GCC (2004): 1st Edition - SAPS

www.saps.gov.za › services › bidthumbnail

01 Jan 2021 · This specification calls for the provisioning, installation, commissioning and servicing/repair of air conditioning at various SAPS Devolved ...

[PDF] bidder's disclosure - SAPS

www.saps.gov.za › services › bidthumbnail

quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to.

[PDF] Technical Indicator Descriptions: 2017/2018 - SAPS

www.saps.gov.za › about › stratframework › strategic_plan › saps_tec...

Supporting evidence for quarterly/annual reporting. Manual System (Excel spreadsheet) report. Calculation type. Cumulative. Method of calculation. (formula).

[PDF] Technical Indicator Descriptions: 2017/2018 - SAPS

www.saps.gov.za › about › stratframework › strategic_plan › saps_tec...

21 Feb 2017 · The management of non-financial performance can be described as the process to collect, verify, analyse and report statistical data to determine ...

[PDF] special conditions of contract 19/1/9/1/74td (21) - SAPS

www.saps.gov.za › services › bidthumbnail

26 Jan 2022 · The installation qualification report of the test and diagnostics conducted by the successful bidder during the installation, must be documented ...

formul calcu

×

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Showing results for formula calculation To conduct repairs, installation saps dhet

Search instead for formul calculationTo conduct repairs, installation saps dhet

[PDF] NATIONAL POLICY ON THE CONDUCT, ADMINISTRATION AND ...

www.dhet.gov.za › 1Policy on the conduct of exams 30287 of 12 sept...

26 Management of the conduct of the National Certificate Vocational Examinations beyond the borders of the Republic of South Africa.

[PDF] Continuing Education and Training Act: Draft: National policy ...

www.dhet.gov.za › SiteAssets

09 Apr 2021 · The policy aims to provide a direction regarding the conduct, administration and management of the examinations for colleges.

[PDF] Education Labour Relations Council (ELRC) - policy handbook for ...

www.dhet.gov.za › ...

Schedule 1 – Code of Conduct for Arbitrators and Conciliators. ... To provide for the determination of national policy for education; to amend the National ...

Code of Conduct - SAPS

www.saps.gov.za › about › conduct

with integrity, render a responsible and effective service of high quality which is accessible to every person and continuously strive towards improving this ...

Missing: formula calculation dhet

[PDF] amd1_supplier_registration_form.pdf - SAPS

www.saps.gov.za › services › downloads › amd1_supplier_registratio...

This Registration Application represents an expression of interest from the supplier to conduct business with. SAPS. Once submitted, your details will be ...

Missing: formula dhet

Services | SAPS (South African Police Service)

www.saps.gov.za › newsroom › selnewsdetails

08 Mar 2022 · “It costs the SAPS a lot of money to operate a water cannon to a students' protest, it is expensive to procure rubber bullets and if students ...

Missing: formula calculation

[PDF] special conditions of contract 19/1/9/1/123tp (22) - SAPS

www.saps.gov.za › services › bidthumbnail

The South African Police Service requires prospective suppliers to submit bids for ... The following formula will be used to calculate the points for price:.

Missing: dhet | Must include:dhet

[PDF] SOUTH AFRICAN POLICE SERVICE ACT 68 OF 1995

www.saps.gov.za › legislation › acts

15 Oct 1995 · (h) conduct research into any policing matter in accordance with the instructions of the Minister and report to the Minister thereon;.

Missing: formula dhet

[PDF] acting appointments policy - PSA

www.psa.co.za › docs › newsletters › acting_appointment_policy

8 Acting allowance is calculated on the basis of the difference between the current salary notch of the employee and the commencing salary notch of the higher ...

[PDF] National Water and Sanitation Master Plan

www.gov.za › sites › default › files › gcis_document › national-water...

01 May 2015 · access to a basic water supply service and 14.1 million people do not have access to safe sanitation. Only 64 % of households have access.

Related searches

DHET examination policy

Policy on conduct and administration of examination

Examination policy for TVET Colleges

SAPS Code of conduct pdf

SAPS Code of conduct summary

Consequences of not signing the SAPS Code of conduct explained

DHET Policy documents

11 of 756

This is to confirm that an incident was logged On: 2023/09/21 5:42:19 PM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za Thu, Sep 21, 5:42 PM (19 hours ago)

to me

Dear tshingombefiston tshingombefiston,

Thank you for contacting National Treasury OCPO Contact Centre.

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Incident #	**1613503**
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Priority:	3
Status:	Logged
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Description

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[X]

department of science and innovation socio economic development,
-1 .programme administration technology innovation international cooperation
Gov , city power and St peace college
Programme, exposition science

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St peace college lecture and learner development under planning. Department high Education v
saqa vs qcto,vs seta research resolved time table examination Assessment police , Portfolio documents systems integrity police academic,

-2.1. Purpose: innovation practical and theoretical. science and technology science national trac
factor outcome time table trading examination and qualifition framework national diploma n
engineering and council trade sector authority , innovation system outcomes empower system
subject entry phase learning and lecture teach science exhibition generation technology
Assessment police ,and Engineering assessment trade machine and trade control system proces
project system control evaluation system
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Electrotechnolgy empower value are recreation orientation maximum, value tax , return studies
and
Examine electro technology engineering time table assessment
Completed research laniaries system technology value entry lecture exam nated vs. saqa vs qcto
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-Job duty cycle system value : learner lecture framework qualifition and occupation trade job va
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minimum ,task minimum service require trading sectors and maximum sectoral electrotechnolo
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Meeting salt .dmrg stick ,sale revenue power plant fuel used national treasure sars department energy mandatory ensure private sector participr in power generation ,
Meet national skill fund,, national research fund ,,
Visa permit
[X]
[X]

On Thu, Sep 21, 2023 at 5:26 PM tshingombe fiston > wrote:
portfolio evidence

National Treasury EMail Disclaimer

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Reason to sign the Code of Conduct of SAPS

Next >

2001, Johannesburg

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tshingombefiston@gmail.com - Sign out

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For Your Information: Thank you for registering on our job site

Inbox

Noreply Sat, Jun 24, 9:42 AM

From SYSADMIN To TSHINGOMBE, TSHITADI Sent 2023-06-24 09:42:17 ID 61095446 Welcome to the South African Reserve Bank and thank you for registering on our job si

t

tshingombe fiston <tshingombefiston@gmail.com> Sat, Jun 24, 9:55 AM

to applmgr

Skip navigation elements to page contents

iRecruitment

0

Logged In As TSHINGOMBEFISTON@GMAIL.COM

Recruitment HomeJobs

GeneralMy Account

Enter Personal Information Add Qualifications and Skills Enter Preferences

Register: Personal Information

Step 1 of 3

Provide your personal and professional details to complete your profile.

* Indicates required field

Basic Details

Please enter your personal information.

* Title

* Surname **TSHINGOMBE**

* First Name	TSHITADI
Known As	tshi
* Birth Date (YYYY-MM-DD)	2022-11-10
* Gender	
Email Address	TSHINGOMBEFISTON@GMAIL.COM
Middle Name	tshingomb
* Race	African

This information will be separated from your application and does not form part of the TIP selection process. It will be retained by the Human Resources Department purely for statistical purposes.

Source Details

Source

Source Name ts

(example: if you saw our ad in a Newspaper, which Newspaper?)

Address

Country

* Address Line 1 <Please enter>percy street 103 yeoh

Address Line 2 percy street yeohvill 103

Address Line 3 percy street yeohvill

* Town / City jhb

* Postal Code 1030

Province gauteng

Phone Numbers

Residential

Cellphone

Business

Business Fax

TIP Do not use any characters or leave spaces between the numbers

Documents

GP000962852023-Insufficient Information Closure Letter-26042023 (003) TSHINGOMBE (1).pdf	Resume	2023-06-24	

TIP To upload your resume (CV) to your account, choose the Add Another Document button.

Step 1 of 3

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GeneralMy Account

Enter Personal Information Add Qualifications and Skills Enter Preferences

Register: Add Qualifications and Skills

Step 2 of 3

* Indicates required field

Employment History

Show All Details | Hide All Details

Details

st peace college /city powe

metering

jhb

Description of Job Duties

engineering electrical metering cash power / studie

Education Qualifications

Please enter details of the colleges and universities which you have attended as well as the Qualifications received. If you have qualifications which were not obtained at a school or college you may enter those later as Additional Qualifications.

College or University (Required)

st peace college

Location (Required)

jhb

TIP If you have more than one qualification from an establishment, press the Add Degree icon to record further qualifications.

Additional Qualifications

Please enter details of your additional qualifications. Qualifications obtained from a college or university should be entered as part of your Education information listed above.

2021	4

Step 2 of 3

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Register: Enter Preferences Step 3 of 3 Want to Find the Right Job? Enter your work preferences to help us find the right job for you. KeywordsJob Category Empl

t

tshingombe fiston Sat, Jun 24, 10:16 AM

Available JobsJobs Applied For Confirmation Thank you for registering. Matching Jobs No job matches your current work preferences. Click Search for More Jobs to

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No results found.

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Inbox

Noreply <applmgr@resbank.co.za> Sat, Jun 24, 9:42 AM

to TSHITADI

Be careful with this message

This message contains one or more attachments that can't be verified as safe. Avoid downloading them unless you know the sender and are confident that this email is legitimate.

From	SYSADMIN
To	TSHINGOMBE, TSHITADI
Sent	2023-06-24 09:42:17
ID	61095446

Welcome to the South African Reserve Bank and thank you for registering on our job site. Now you can easily search for jobs, apply and update your personal profile.

Your username is TSHINGOMBEFISTON@GMAIL.COM. If you forgot your password, you can use the 'Forgot Password' link on the login page of our job site.

If you do not log in for an extended period of time, you may need to reregister and provide your most up-to-date information.

All the best with the job hunting process!

---------- *** Disclaimer *** ----------
Important Notice: This e-mail is subject to the e-mail disclaimer of the South African Reserve Bank, which can be viewed at:
http://www.resbank.co.za/Disclaimer/Pages/SARB-Disclaimer.aspx Should you be unable to access the link provided,
kindly send an email to BSTD-ICT-ServiceDesk@resbank.co.za
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tshingombe fiston <tshingombefiston@gmail.com> Jan 3, 2024, 11:11 AM

to tenderadvicecentre, TSHINGOMBEKB, tshigombekb, tahitaditshingombe, wmcqueries, estimations, Central, csd, DMR, tax, admni, study, bee-complaints, SARB, ECSA, GITServiceDesk

RESEARCH AND DEVELOPMENT (R & D) TAX INCENTIVE NOTIFICATION OF CHANGES REPORT

The purpose of this form is to indicate any material change(s) made to any ongoing project/ programme / technological area that has been approved in terms of the amended Section 11D of the Income Tax Act, 1962, (Act No.58 of 1962). It is a requirement of the Act that such changes must be reported.

This form must be completed in full and submitted to Department of Science and Technology using one of the following methods:

Hand or courier to Building 53, Scientia Campus, Meiring Naudé Drive, Brummeria;{After hours use the drop box at the DST entrance}; or

Registered mail to:

Private Sector R&D Activities Unit, Department of Science and Technology

PostNet Suite 133

Private Bag X844

Silverton

0127

Enquires can be directed to tax@dst.gov.za, or send a fax to 086 685 9528, or phone 012 843 6829.

PART 1 – PARTCULARS OF THE COMPANY

101	Name of the Company	Tshingombe tshitadi engineering

102	Tax reference number	9	7	2	2	3	2	8	2	3	8

103	Tax Year	2	0	23	

PART 2: PARTCULARS OF CHANGES IN THE PROJECT/ PROGRAMME / TECHNOLOGICAL AREA

201	Project, Programme or Technological Area Name	202	Application Reference Number	203	Project, Programme, Technological Area current status *(In-progress , suspended, discontinued)*	204	Status Effective date

Engineering electrical	520	Cvs portofolio	2021

PART 3: PROJECT/PROGRAMME/TECHNOLOGICAL AREA - SPECIFIC INFORMATION

For each of the projects, programmes or technological areas listed above please provide the following information (You may reproduce Part 3 in case of multiple projects)

Name of project/programme/technological area:.....

301

(a) Please indicate with an X, type of change made to the Project/ Programme/ Technological area

y

i. Objective

yx

ii. Methodology of research

iii.

yx

Funding

iv.

x

Country where some of the R&D Activities were/will be undertaken

v.

x

Other (please specify) …….

(b) Discuss any incremental change, as selected above, which occurred with respect to the research and development activities of the project/ programme/ technology area.

.....implentation engineering electrical collge frame work in job porto folio evidnce file student .....

department of science and innovation socio economic development,
-1 .programme administration technology innovation international cooperation
Gov , city power and St peace college
Programme, exposition science

-2.programme research development support :
St peace college lecture and learner development under planning. Department high Education vs saqa vs qcto,vs seta research resolved time table examination Assessment police , Portfolio documents systems integrity police academic,

-2.1. purpose: innovation practical and theoretical. science and technology science national trade factor outcome time table trading examination and qualifition framework national diploma n engineering and council trade sector authority , innovation system outcomes empower system subject entry phase learning and lecture teach science exhibition generation technology Assessment police ,and Engineering assessment trade machine and trade control system process project system control evaluation system
2.1.2 knowledge: innovation practical and theoretical trade technology electrical engineering Electrotechnolgy empower value are recreation orientation maximum, value tax , return studies and
Examine electro technology engineering time table assessment
Completed research laniaries system technology value entry lecture exam nated vs. saqa vs qcto linearism system electro technology power fundamental job duty job maximum, job value minimum trade operational, task minim component system,
-Job duty cycle system value : learner lecture framework qualifition and occupation trade job value salary resource human maximum fiscality minimum technology components system : sciences natural system investigation design minimum agreement value job trade module,task minimum ,task minimum service require trading sectors and maximum sectoral electrotechnology trading components
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objectivity:
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System outcome , trading education technology systems power factor demand system education , efficiency system assignment power objectivity module task , maximize inventories psychopedagogie metric system month week of observations learner form test assessment assignment control tpm maintence meeting product control technology goal .

-1.2.3.4: development humain generation: system teaches sector organisations technology rate value maximum rate demand factor admnise value ask required report system value.
-1.2.5.component: trading lecture used company manufacture relate system Industrial Education system intelligence management system information ,education computing control system switch and material support command disposition component

manufacturers
Numerical time table framework regulatory Education trade relate handbook guideline information and orientation integrative system component handbook relate maintenance update , upgrade system
-1.2.6: basic science infrastructure: implantation of research innovation mission equipment
College equipment framework theory practical lab workshop workplace implantation department gov system ,more

Inovation,tax incentives,,
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Meeting electrical conformance board design installer regulatority Cox competition b

Meeting salt .dmrg stick ,sale revenue power plant fuel used national treasure sars department of energy mandatory ensure private sector participr in power generation , Meet national skill fund,, national research fund ,,
Visa permit

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(c) What challenges were encountered that led to changes indicated above in the R&D project that was previously approved by the Department of Science and Technology?

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2023

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Examine electro technology engineering time table assessment

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System outcome , trading education technology systems power factor demand system education , efficiency system assignment power objectivity module task , maximize inventories psychopedagogie metric system month week of

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Meet national skill fund,, national research fund ,,
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tshingombe fiston <tshingombefiston@gmail.com> Wed, Sep 20, 5:31 PM (10 days ago)

to **TSHINGOMBEKB**, **tshingombe**, DSI-Notification

partment of science and innovation socio economic development,

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-2.1. purpose : inovation practical and theoretical. science and technology science national trade factor outcome time table trading examination and qualifition framework national diploma n engineering and council trade sector authority , inovation system outcomes empower system subject entry phase learning and lecture teach science exhibition generation technology Assessment police ,and Engineering assessment trade machine and trade control system process project system controle evaluation system

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1

to **tahitaditshingombe**, TSHINGOMBEKB, me, tshitaditshingombe

The Electrical Conformance Board of South Africa takes it's role as the national umbrella body for the electrical sector seriously. We constantly try to help and answer all questions as quickly as possible and also help to mediate between conflicting parties.

Please be aware that the ECB is a Not for Profit organisation and as such we are limited by our resources and budget to help you. Please be patient as we have in excess of 7,000 cases each year and we want to ensure each case gets the time it deserves.

If you are happy with the work we do for you and the industry please feel free to send us a donation. We really appreciate everyone of our contributors that help us make the electrical sector a safer.

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Type

Date

Number

PO/Check Number

Members Area

Set Up

Billing

Print a Statement

See A/R Register

See All Transactions

Custom

SuiteSocial

Registration related updates

Upload Files

Certificates of Compliance

CoC's in Progress

View, Confirm or Cancel a CoC

Quick View

Outstanding Balance R0

Open Cases 0

Pay by Credit Card

Registration Update

Buy eCoC Credits

View eCoC Credits

Begin a CoC (until July 2021)

Begin a CoC Sans 10142-1 Ed3

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Support

Contact Support

See Support Cases

Edit Your Profile

Home redirect

Members Area Change Email Change Password

Logout

Print Individual Statement

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Inovation,tax incentives,,
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Technology design engineering,systems engineering,

.project

1..project

-High school theory practice week grade

Theory labo work shop high school ,

- university theory practice workshop lab

- instituts case studies research

-college workshop workplace theory compagny workshop experience career

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: projection design analyse

-Project Principe design

-project diagram laballed schematic

-Projects diagrams power circuit

-Project commander control way

-Project experience measure test

.diagramme algorigramme logigrame organigrame ,diagrammed sequential ,

Concept design planogramme, algorithm . Graphcetp

- purpose engineering,

1.initial sequence implentation

1. purpose of plan. Dhet yes,

key switch contact

-aim of plan yes,

-objectivity plan yes

- key delivery area

2.implementation monitoring of teaching

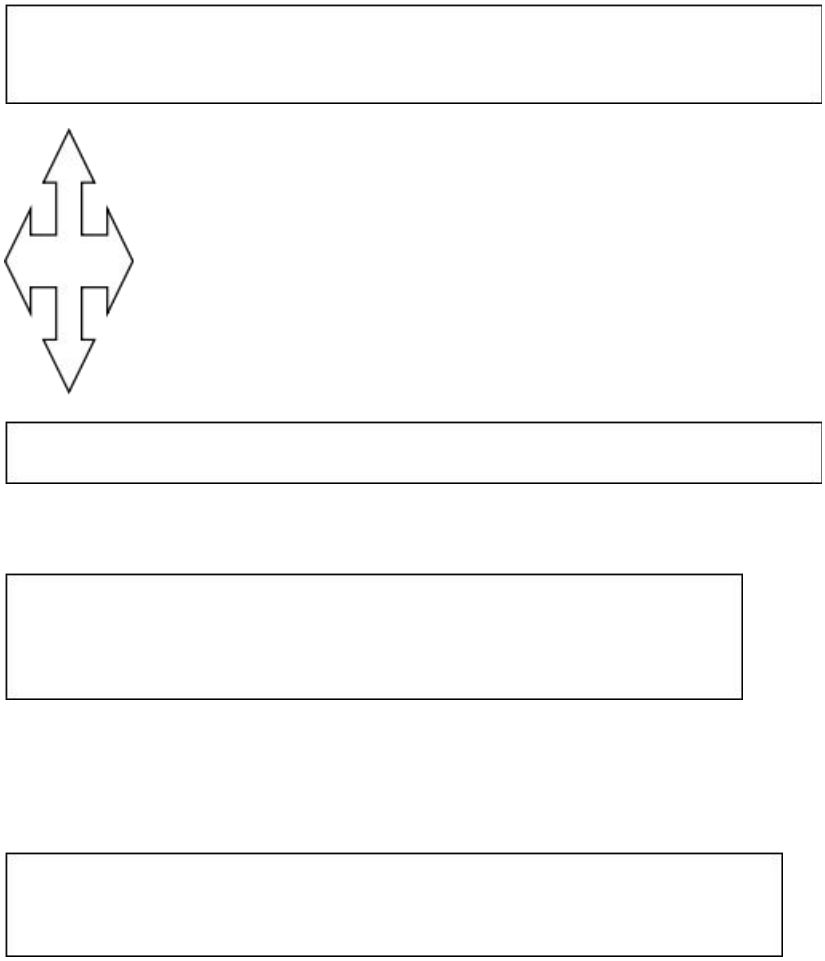
--purpose yes

- trade test QCTO license yes ,let /lep

3purpose.

-4 purpose and evaluation saqa log

- 5where appropriate , undertake manufacture maintence pane



l yes

-6.1 Value Assessment saqa vs NC's infractuture.

7

7.purpose dhet education career bridge stabi base phase job paychomoty yes

-8 dhet ,vs sasseta accreditation Assessment mil STD , safety training merseta required gasst .

-8.2

9. purpose manufacture relate theory practical componey equipment trade ton max chain load diam trade code objy credit theory vs practice test manufacture yes,

-10.purpose dhet national electronics fundamental engineering level and License trade engineering.

Compare low test methode notion Hopkins

-Purpose wiring electric wire way premise protection line fire

-10.2 purpose engineering science module completed algebraic linearing foindamental system proce fabric y yes,

-engineering science theory fundamental research step y learner plan lecture plan mapping investiga Analyse,

11.pupose instrument measure trade engineering e measure control lab ,

-1.2 dhet vs saqa practical work experience lab workshop workplace Industrial trade purpose machir manufacturers..

-13. Dhet ncv nated lect vs saqa subject electrical principle practice , nqf level,

14.puroae dhet et vs seta sasseta skill programme management electronics,securtgradd assess threa for installation ,

15.purose student information system,stui managy system revolutionized, and steing wit,cost effey interactive,collect.

diagram logigram algorigramme

-1intialisation : start

-implementation circulum knowledge circulum policy engineering planing product improvement con agreement e registerer and consultant e electrique Computer. Yes

2.purpose ask factor career outcome transition phase learner phase exhibition phases teach beginni

3.method material and equipment scientific guidelines assess formation Summative rubric tools asse learner and teacher time e. Yes

4.result nantecht and minint what is technology wath are day of mining how is nanotechnology ener

4.conclusion : ent discovery Computer training t and support services to existing or prospective club

to DSI-Notification, TSHINGOMBEKB, tshingombe

1

.CVS Title government and Education job Engineering college.

1.conte t engineering electrical career project Project officer outcom e legislation government engineering gov city .yes

2.2 abstract job work career category job skills.yes

3. Entry Engineering electrical trade infractuture implentation support. Yes

4. Purpose asssessor .vyes

4.1 case study how make calculation for a distribution substation.

Yes

- 5.requirement substation , 5 purpose and required , advance basic.

Yes

6. Requirements power station and central system appliances TV reliable ,

Yes

8.requirement Dimensioning workplace.

Yes

8.2 fonctionalite principal .

Note cacul office , bureau studi ,sabs ,ECB,realii calcul test

Yes

9.reauired domain application distribution network .

Yes

10.of electromagnetic induction to solve problem.

Yes

11required energy dimensioning,

Yes

15.1 rate discharge required need adjusting energy determine secondt control power requirements.

Yes

16. Required functions function

Requirements flow down from level1.system design processes1.1 requirements definition process ,1.1.1stskehold expectation definition yes1.1.3technical solution

Algorigramme, logigram

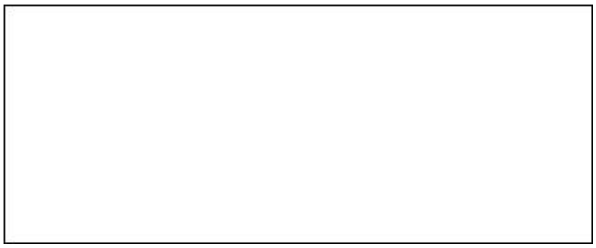
Key lock,,

-Equation key equation lock comparable logic

K1.1 x +k.2.1+kn ..= k implentation

K1.1x+k.2.1+kn..=k.implementation

_____



Add. Method value :

Substitute value: key

Compare value :

Step operator ..

_____

Way key switch

K.1.

Outcome, education technology technology electrique ,electrotechnology EIC

EIC : electrotechnology : electrical international commissioner rules ,

Commissioner electrical international,commission energy,,commission ligthning,, system international physic ,chemical ,,

Construction electric association ,information rules

Labels,

Power empower : fundamental system, process implentation phase operationel step task project:

Schematic diagram: principal game

Technologie ,supplies power purpose power : rules attorney: machine system control process Project fabric.

- power commissioning code standard

Value nominal operationel work :

-value minimal operationel work labour:

-value value cut operationel ,

Value selected , choice basic advanced purpose diagram design Key lock contacting value outcom technologie are Cree.

-principle schematic: schedule

Orientation projection flow share line manager system process purpose horizontal vertical team line flow

-Purpose purpose : 1.1,,1.2,,1.3,,1

5.. operationel task ,logic diagram logigram , organigrame organisation orientation planing supervisor

- design organigrame:

Way key switch organisation supervisor planing way , 2 way ,3,way block Mono schedule schematic,4 way switch suplie power recall delay relay o'clock dimer

-Organigrame schematic blocks,convert information :

,,Organigrame board metering , logigram , algorigramme.bod distribution board , distribution system design .

- equation logic : state logic ,0or 1, voltage 220,380

F1=0, F2=0,F3=0, circuit breaker MCB

MCB1=0,MCB2=0,MCB=3, Line 1,2,3 state = 0,

F1+F2+F3, ,metering kWh=0 , kvarh=0,KVA =o cos meter= 0

Circuit breaker ,over load rcdbo =0,

Db box system db=0, operationel technologie,

Equation logic

Db= F1.+MCB+kvar+kwh

Power supply,

Db = lights+ outlet socket+guyzer+

Sw1=1 light = 1, sw2=1,sw3=1,SW 6, ,SW 5,

- organisation

dol ,reverse. Load.

Km1= F1+so+(S1+km1). Motor

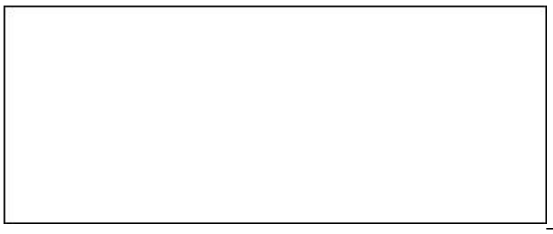
Km2=F2+s0(S2+km2)..

K1m = F1+so(S1+km1).km2

K2m=f2+so(S2+km2).km1

K start= F1+so(S1+km1).k d

K delta=F2+so(S1+km2).ks



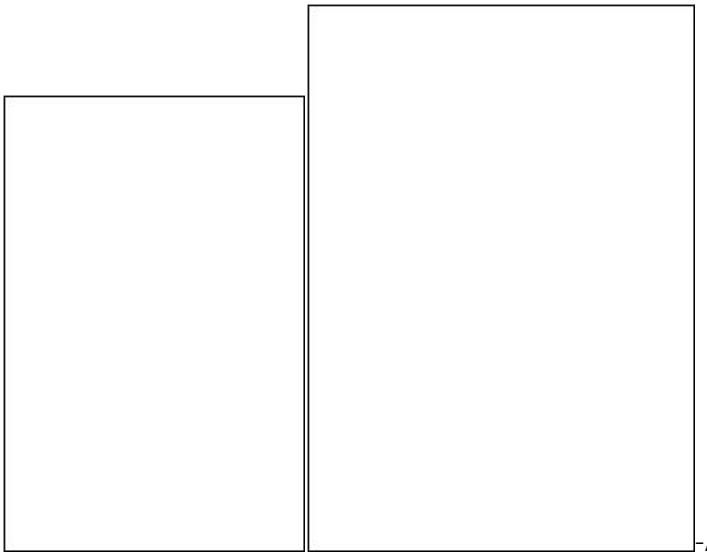
On line generator ,,transformer

transmitters

Kgenerator =F1+so(S1+kg1).kg 2

Kgenerator=F2+so(s2+kg2).kg.2

Transformer = F,=,1,(Q+break+Q).(Q+break+Q)+transfo + Q+Brak+Q+



-Algorigramme: operationel system

Initial f1.start ..F1=1 yes , or not initialisation,F2=1,yes ,or egual =o initial

Initiation , f 3=1,yes or equal=0 initial ,

.,SW = 1:,yes ,,km = 1, yes,kg=1 yes step or reininitialisatiin .

Db box = ,1 ,,D's=,1 activation atstem

End procedure ,,

Logigramme algebraic boolen ,

Coventer

Binaire 2. 0,1,decimal base 10, hexadecimal 16,

Input / out put logic byt

Sw1=0,sw2=0,sw3=0,SW=0/ 0000,

Base 10,,base 16

S1=0,S2=0,S3=0, S4=0,=0/0000

Km=0,km=0,km=o,km=0,/0000

Kg=0,kg=0,km=0,Km=0/ 0000

,

Fortran

CLS program,PLC

10.Print sw1

20.Print sw2

30.print sw3

40.print sw4

50 print S1,

60 print S2

70 print S3

80 print s4

90 print km

100 .print kg

110.print t

Input ="sw1", sw2,sw3,sw4,Se

Input = S1, S2,S4,S4,,

Input = km,

Input = kg

If " sw1"= 1, l =

Else

Show

String

Robotic research operationel

Algo pin address value scater position

_-

-

Analyse design ,analyse circuit.

Sequence , circulum purpose

- call key display sw1,sw2,sw3,sw4

-call and recall ,db ,Q

- call and recall current sw1,sw2,sw4

- call way key

+ Call km,call kg ,call.

-Module call and recall sw1 task ,call task ,sw2 ,call task sw1 required contact task sw1 = 0, sw1=0,

Task km

Call pression pressosta kp,call manosta ,call detector call,termomete kt Relay

Current exp

-Module calculator operationel, call task ,call , sw1 operationel logic add, substraction , multiplication,division task

Module inverter ,module multiplex ,

Integration circuit module switch

,

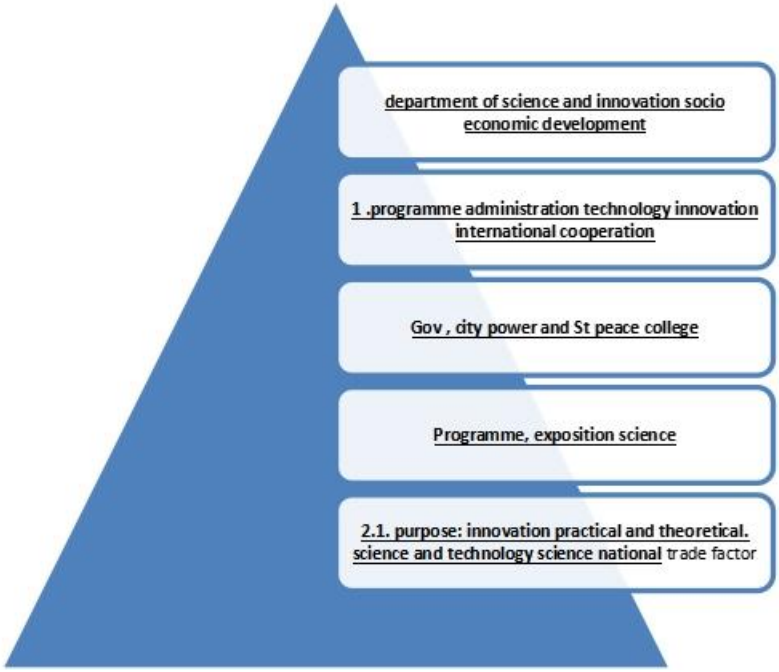
Call pression under pressure,

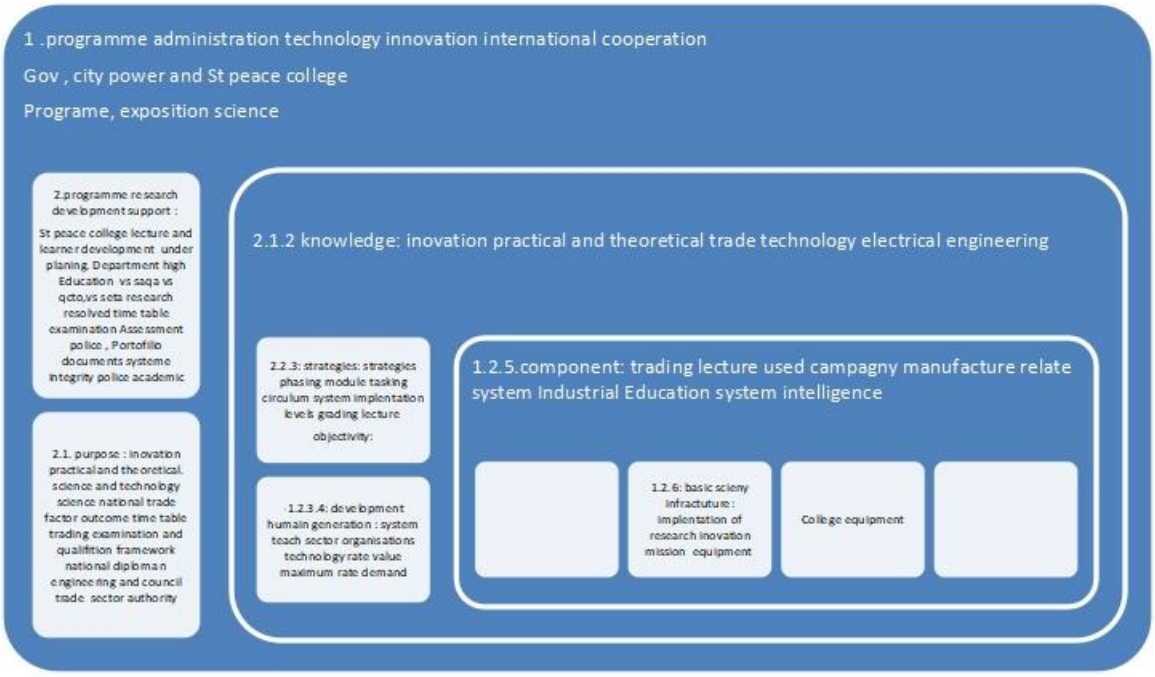
Call , module calcule step task ,S2,S2,s3s4,sequence pression ,selector

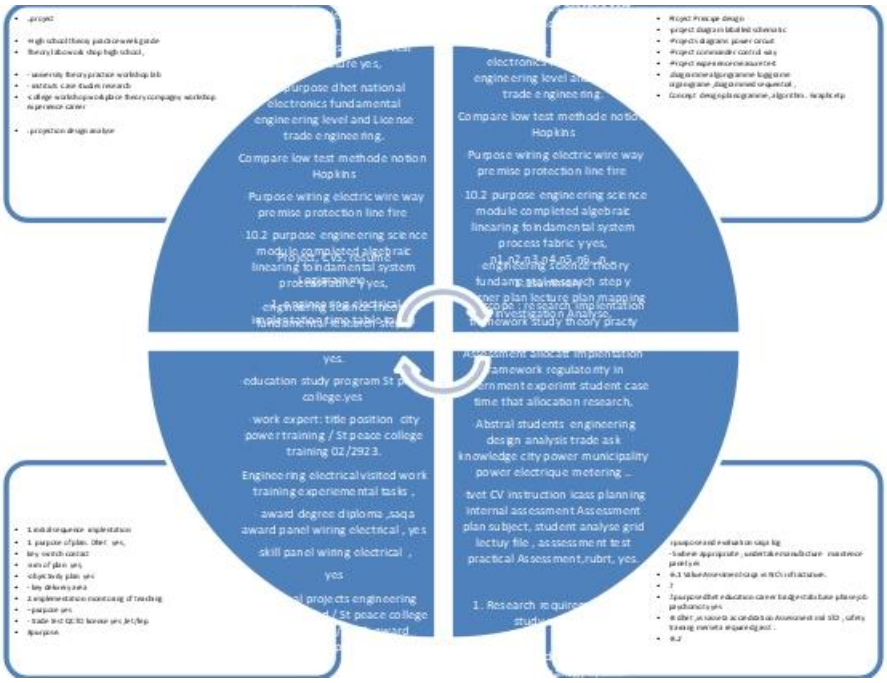
Call pin address ,transistor thyristor comande task ,

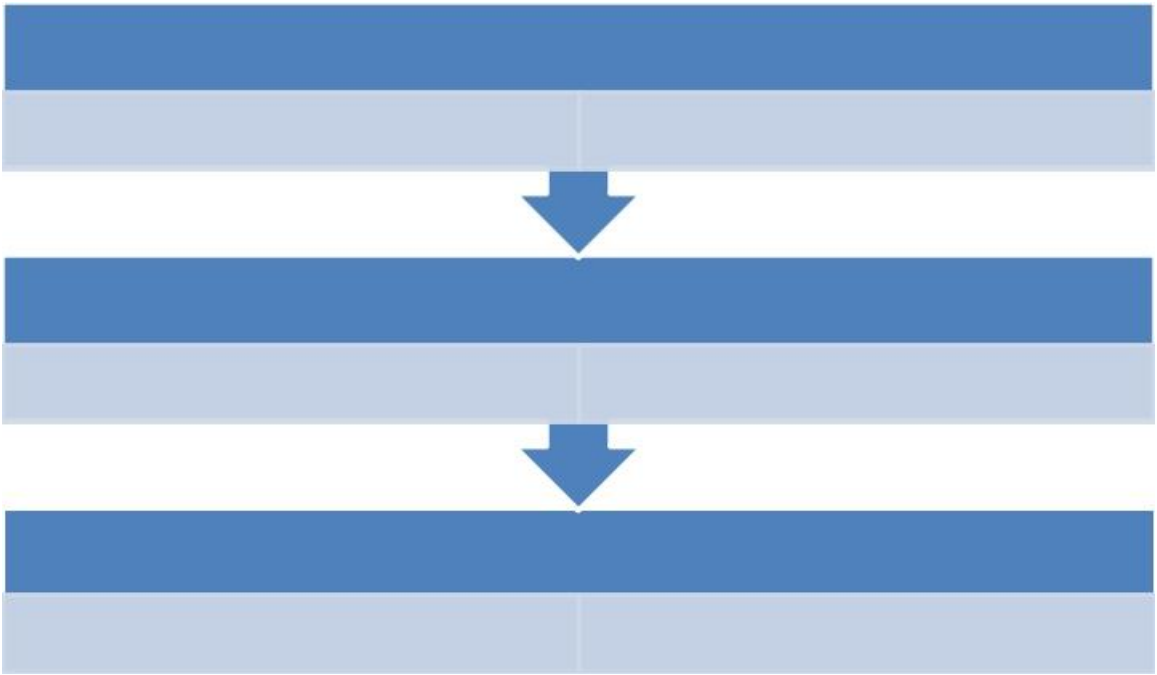
Call module matrices

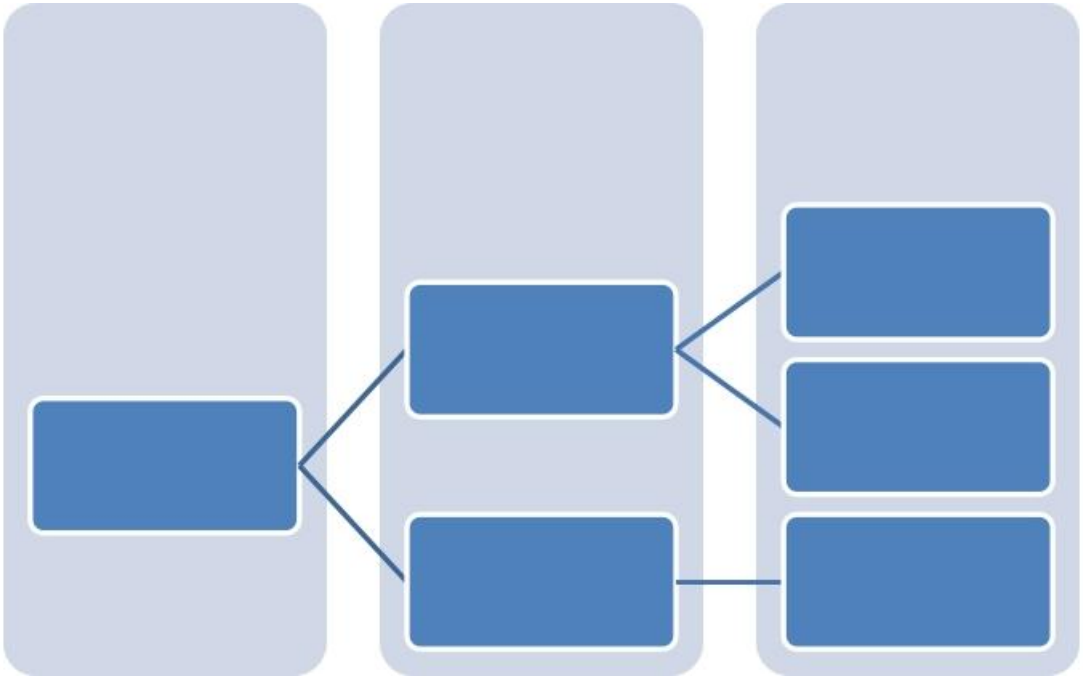
,Display module.. operationel system call recall task ,multi task multi use, mmono task, call windows,, operating system call motor lecture current disc tape magnetic electromagnetic memory card , reader card call ,sub system

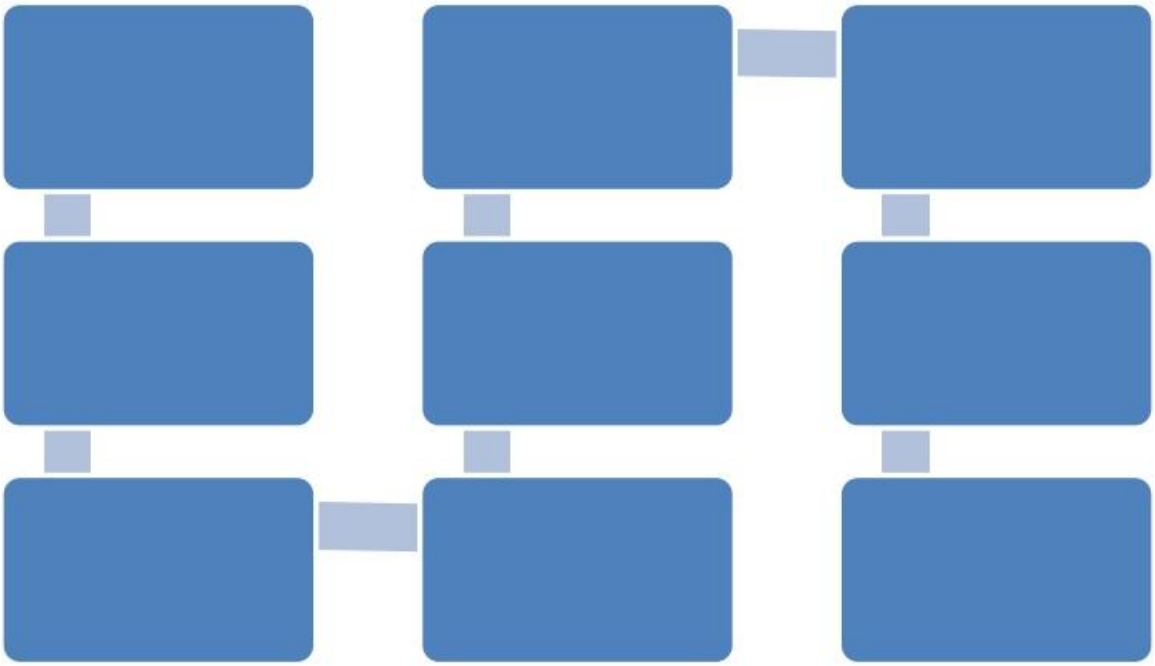

department of science and innovation socio economic development
1 .programme administration technology innovation international cooperation
Gov , city power and St peace college
Programme, exposition science
2.1. purpose: innovation practical and theoretical. science and technology science national trade factor


1 .programme administration technology innovation international cooperation
Gov , city power and St peace college
Programe, exposition science
2.programme research development support :
St peace college lecture and learner development under planing. Department high Education vs saqa vs qcto,vs seta research resolved time table examination Assessment police , Portofilio documents systeme integrity police academic
2.1. purpose : inovation practical and theoretical. science and technology science national trade factor outcome time table trading examination and qualifition framework national diploman engineering and council trade sector authority
2.1.2 knowledge: inovation practical and theoretical trade technology electrical engineering
2.2.3: strategies: strategies phasing module tasking circulum system implentation levels grading lecture
objectivity:
1.2.3.4: development humain generation : system teach sector organisations technology rate value maximum rate demand
1.2.5.component: trading lecture used campagny manufacture relate system Industrial Education system intelligence
1.2.6: basic scieny infractuture : implentation of research inovation mission equipment
College equipment


Compare low test methode notion Hopkins
Purpose wiring electric wire way premise protection line fire
10.2 purpose engineering science module completed algebraic linearing foindamental system process fabric yyes,
education study program St p college.yes
work expert: title position city power training / St peace college training 02/2923.
Engineering electrical visited work training experiemental tasks ,
award degree diploma ,saqa award panel wiring electrical , yes
skill panel wiring electrical ,
yes
Abstral students engineering design analysis trade ask knowledge city power municipality power electrique metering ...
twet CV instruction icass planning internal assessment Assessment plan subject, student analyse grid lectuy file , assessment test practical Assessment,rubrt, yes.







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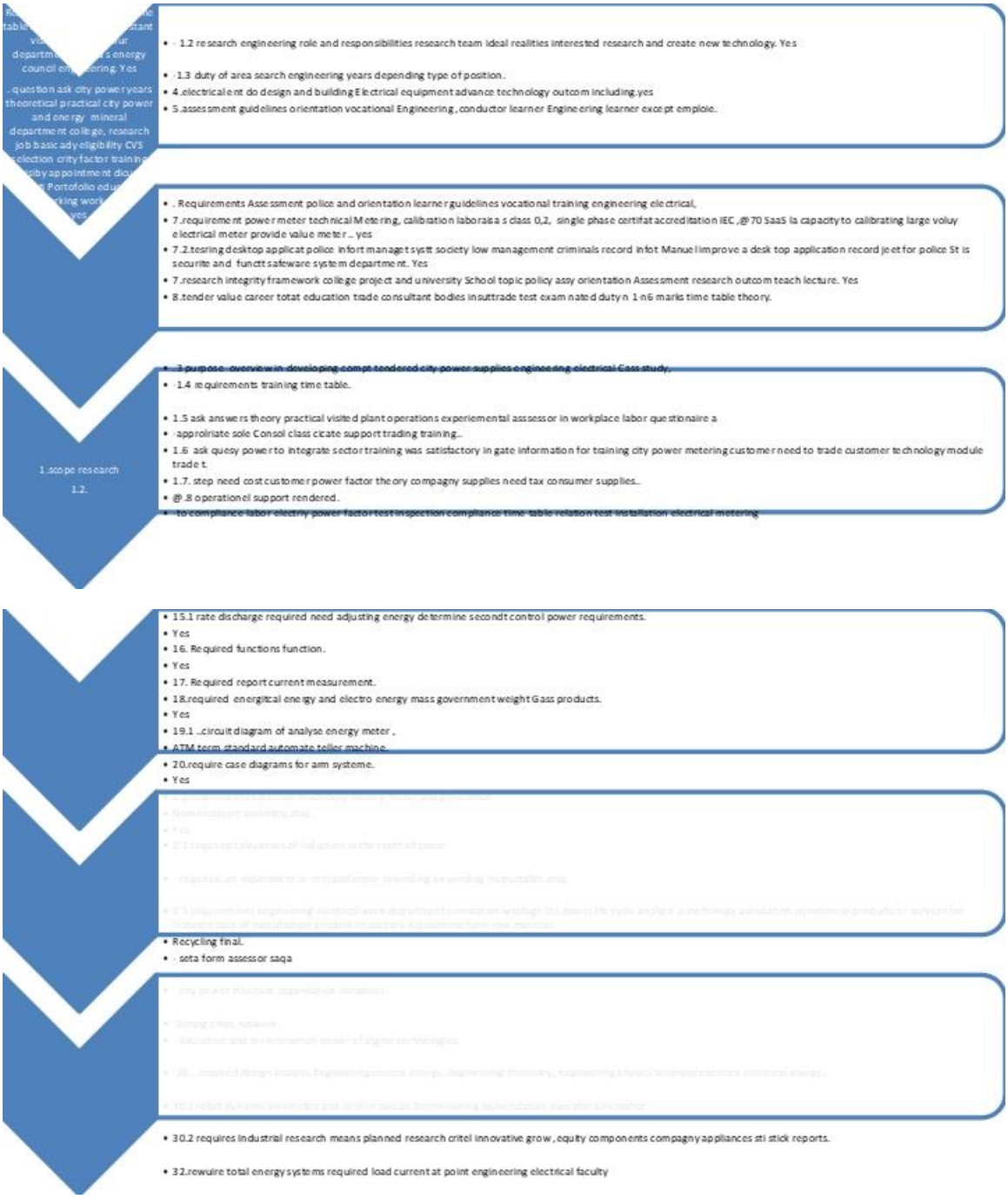
1.2 research engineering role and responsibilities research team ideal realities interested research and create new technology. Yes
1.3 duty of area search engineering years depending type of position.
4.electrical ent do design and building Electrical equipment advance technology outcom including.yes
5.assessment guidelines orientation vocational Engineering, conductor learner Engineering learner except emploie.
. question ask city power years theoretical practical city power and energy mineral department college, research job basic ady eligibility CVS
. Requirements Assessment police and orientation learner guidelines vocational training engineering electrical,
7.requirement power meter technical Metering, calibration laboratas s class 0,2, single phase certifat accreditation IEC ,@70 SaaS la capacity to calibrating large voluy electrical meter provide value meter .. yes
7.2.tesring desktop applicat police infort manage t syst society low management criminals record infot Manuel improve a desk top application record jeet for police St is securite and functt safeware system department. Yes
7.research integrity framework college project and university School topic policy assy orientation Assessment research outcom teach lecture. Yes
8.tender value career totat education trade consultant bodies insuttrade test exam nated duty n 1 n6 marks time table theory.
1.4 requirements training time table.
1.5 ask answers theory practical visited plant operations experiemental asssessor in workplace labor questionaire a
approliriate sole Consol class cicate support trading training..
1.6 ask quesy power to integrate sector training was satisfactory in gate information for training city power metering customer need to trade customer technology module trade t.
1.7. step need cost customer power factor theory compagny supplies need tax consumer supplies..
@.8 operationel support rendered.
1.scope research
1.2.
15.1 rate discharge required need adjusting energy determine secondt control power requirements.
Yes
16. Required functions function.
Yes
17. Required report current measurement.
18.required energitcal energy and electro energy mass government weight Gass products.
Yes
19.1 ..circuit diagram of analyse energy meter ,
ATM term standard automate teller machine.
20.require case diagrams for arm systeme.
Yes
Recycling final.
seta form assessor saqa
30.2 requires Industrial research means planned research critel innovative grow, equity components compagny appliances sti stick reports.
32.rewuire total energy systems required load current at point engineering electrical faculty

31567

Registered Party:Project STPEACECOLLEGE /CITYPOWER TSHINGOMBE

Balance 0.00 ZAR

*Statement Date 13/5/2023

Start Date 13/4/2023

Show Only Open Transactions ☑

.CVS Title government and Education job Engineering college.

1.conte t engineering electrical career project Project officer outcom e legislation government engineering gov city .yes

2.2 abstract job work career category job skills.yes

3. Entry Engineering electrical trade infractuture implentation support. Yes

4. Purpose asssessor .vyes

4.1 case study how make calculation for a distribution substation.

Yes

- 5.requirement substation , 5 purpose and required , advance basic.

Yes

6. Requirements power station and central system appliances TV reliable ,

Yes

8.requirement Dimensioning workplace.

Yes

8.2 fonctionalite principal .

Note cacul office , bureau studi ,sabs ,ECB,realii calcul test

Yes

9.reauired domain application distribution network .

Yes

10.of electromagnetic induction to solve problem.

Yes

11required energy dimensioning,

Yes

15.1 rate discharge required need adjusting energy determine secondt control power requirements.

Yes

16. Required functions function.

Yes

17. Required report current measurement.

18.required energitcal energy and electro energy mass government weight Gass products.

Yes

19.1 ..circuit diagram of analyse energy meter ,

ATM term standard automate teller machine.

20.require case diagrams for arm systeme.

Yes

2.1 required ent Electrical machinery motory motor and generation

Nomenclature assembly,step

Yes

2.2 required calculation of induction in the teath of stator.

- required ,an experiment in in transformer rewinding an winding instructable.step

2.5 requirements engineering electrical work department orientation wastage life assess life cycle analyse is methology association commercial products or services for instance case of manufacture product impact are Assessment form row material.

Recycling final.

- seta form assessor saqa

- city power structure organisation inovation.

-Strong cities network ,

- Education and for innovation power of digital technologies,

-30.. required design analysis Engineering science energy, engineering chemistry, engineering physics biophysics science electrical energy..

30.1 robot dynamic kinematics and control calcule Dimensioning nomenclature operator kinematics.

30.2 requires Industrial research means planned research critel innovative grow ,equity components compagny appliances sti stick reports.

32.rewuire total energy systems required load current at point engineering electrical faculty

t

tshingombe fiston Thu, Sep 28, 5:03 PM (2 days ago)

-Requirements flow down from level1.system design processes1.1 requirements definition process ,1.1.1stskehold expectation definition yes1.1.3technical solution

t

tshingombe fiston <tshingombefiston@gmail.com> Fri, Sep 29, 7:19 PM (14 hours ago)

to DSI-Notification, TSHINGOMBEKB, tshingombe

-Algorigramme, logigram

-Key lock,,

-Equation key equation lock comparable logic

K1.1 x +k.2.1+kn ..= k implentation

K1.1x+k.2.1+kn..=k.implementation

_____

Add. Method value :

Substitute value: key

Compare value :

Step operator ..

_____

Way key switch

K.1.

t

tshingombe fiston <tshingombefiston@gmail.com> Fri, Sep 29, 9:14 PM (12 hours ago)

to **TSHINGOMBEKB**, **tshingombe**, DSI-Notification

Outcome, education technology technology electrique ,electrotechnology EIC

EIC : electrotechnology : electrical international commissioner rules ,

Commissioner electrical international,commission energy,,commission ligthning,, system international physic ,chemical ,,

Construction electric association ,information rules

Labels,

Power empower : fundamental system, process implentation phase operationel step task project:

Schematic diagram: principal game

Technologie ,supplies power purpose power : rules attorney: machine system control process Project fabric.

- power commissioning code standard

Value nominal operationel work :

-value minimal operationel work labour:

-value value cut operationel ,

Value selected , choice basic advanced purpose diagram design Key lock contacting value outcom technologie are Cree.

-principle schematic: schedule

Orientation projection flow share line manager system process purpose horizontal vertical team line flow

-Purpose purpose : 1.1,,1.2,,1.3,,1

5.. operationel task ,logic diagram logigram , organigrame organisation orientation planing supervisor

- design organigrame:

Way key switch organisation supervisor planing way , 2 way ,3,way block Mono schedule schematic,4 way switch suplie power recall delay relay o'clock dimer

-Organigrame schematic blocks,convert information :

,,Organigrame board metering , logigram , algorigramme.bod distribution board , distribution system design .

_____

- equation logic : state logic ,0or 1, voltage 220,380

F1=0, F2=0,F3=0, circuit breaker MCB

MCB1=0,MCB2=0,MCB=3, Line 1,2,3 state = 0,

F1+F2+F3, ,metering kWh=0 , kvarh=0,KVA =o cos meter= 0

Circuit breaker ,over load rcdbo =0,

Db box system db=0, operationel technologie,

Equation logic

Db= F1.+MCB+kvar+kwh

Power supply,

Db = lights+ outlet socket+guyzer+

Sw1=1 light = 1, sw2=1,sw3=1,SW 6, ,SW 5,

_____

- organisation

dol ,reverse. Load.

Km1= F1+so+(S1+km1). Motor

Km2=F2+s0(S2+km2)..

_____

K1m = F1+so(S1+km1).km2

K2m=f2+so(S2+km2).km1

_____

K start= F1+so(S1+km1).k d

K delta=F2+so(S1+km2).ks

_____

On line generator ,,transformer

transmitters

Kgenerator =F1+so(S1+kg1).kg 2

Kgenerator=F2+so(s2+kg2).kg.2

Transformer = F,=,1,(Q+break+Q).(Q+break+Q)+transfo + Q+Brak+Q+

_____

-Algorigramme: operationel system

Initial f1.start ..F1=1 yes , or not initialisation,F2=1,yes ,or egual =o initial

Initiation , f 3=1,yes or equal=0 initial ,

.,SW = 1:,yes ,,km = 1, yes,kg=1 yes step or reininitialisatiin .

Db box = ,1 ,,D's=,1 activation atstem

End procedure ,,

_____

Logigramme algebraic boolen ,

Coventer

Binaire 2. 0,1,decimal base 10, hexadecimal 16,

Input / out put logic byt

Sw1=0,sw2=0,sw3=0,SW=0/ 0000,

Base 10,,base 16

S1=0,S2=0,S3=0, S4=0,=0/0000

Km=0,km=0,km=o,km=0,/0000

Kg=0,kg=0,km=0,Km=0/ 0000

,

Fortran

CLS program,PLC

10.Print sw1

20.Print sw2

30.print sw3

40.print sw4

50 print S1,

60 print S2

70 print S3

80 print s4

90 print km

100 .print kg

110.print t

Input ="sw1", sw2,sw3,sw4,Se

Input = S1, S2,S4,S4,,

Input = km,

Input = kg

If " sw1"= 1, l =

Else

Show

String

_____

Robotic research operationel

Algo pin address value scater position

_-

-

t

tshingombe fiston <tshingombefiston@gmail.com> Fri, Sep 29, 11:40 PM (10 hours ago)

to DSI-Notification, TSHINGOMBEKB, tshingombe

_____

Analyse design ,analyse circuit.

Sequence , circulum purpose

- call key display sw1,sw2,sw3,sw4

-call and recall ,db ,Q

- call and recall current sw1,sw2,sw4

- call way key

+ Call km,call kg ,call.

-Module call and recall sw1 task ,call task ,sw2 ,call task sw1 required contact task sw1 = 0, sw1=0,

Task km

Call pression pressosta kp,call manosta ,call detector call,termomete kt Relay

Current exp

-Module calculator operationel, call task ,call , sw1 operationel logic add, substraction , multiplication,division task

Module inverter ,module multiplex ,

Integration circuit module switch

,

Call pression under pressure,

Call , module calcule step task ,S2,S2,s3s4,sequence pression ,selector

Call pin address ,transistor thyristor comande task ,

Call module matrices

,Display module.. operationel system call recall task ,multi task multi use, mmono task, call windows,, operating system call motor lecture current disc tape magnetic electromagnetic memory card , reader card call ,sub system

-

DHET...

5.Purpose:

Completed time table implentation coverage Summative regularity, subject n1, n6, asservissemnt task assignment homework, marks allocation. 310x 6 , module , content module scaling. 100 marks , student program, asssessment tools marking memorandum , Isat.icass continued assessment ,

-Body quality insurance re certificate rating low,

..outcom scotiss qualifications value Assessment Portofilio I Engineering low ,teacher lecture judging evidence ,subject Quality Assurance, the completed solutions, recorded programs assign short ,re- assessment develop Engineering , analyse Probly, designing a straight problem, simulating or constructing ,

candidate class	part question	operationel skill	reasoning skill total point achieve

- candidate class /,part question ,//operationel skill/// reasoning skill total point achieve,

Mandatory skill development course analyse staring , ,d..

Topics ,nated levej subject module..

- applyy math skill to manupulr low and working skill , cLccul ,

Applied Engineering electric skill analyse .. administration information.

, description of charge, authority ,

Conducting the assessment: high judging evidence internally marked and verified , re - assesment unit assesment ..

-Question / point of process or accuracy //expected responses

- checks length correct conclusion/ evidence correct reason other draw..-

- / evidence of appropriate add sub correct ,

Correct answer..

-eviden e module total examin ER composite ,overall strategy square ..

- totalprocessand accuracy point for test total reasoning....

-isat integrity icass assessment subject .

Conceptual question problem hydro electric generator concept assuming unit, conversion wath current ,

- integrated concept ligth trading concept cost heater , power

Dhet...principle and practice purpose value work component engineering national ncv n engineering,scopet integrity engineering electrical level 4, and n6 saqa n diplomat examinaty.
- Scope of...isat
-Topic mark engineering trade anted and nave.
Produce, operate component driller.
- sub activities task ,time framework time allocation ,
1 manufacture size weight scale power specific, / time.
Total.
- resource requirements
.
Tools assessment, material...
.

- topic operate and

- challenge n diploma duet vs. saga diplomat vs. Vs. anted test council trade
reasoning teach learners theory practice learning value assessment.

6.Circulum: value add assessment ,is or is not subject to changed,
Saqa engineering...resoningvs counct vs NC's level electrical infrastructure dhet principal theory practical vs ,NC's matric teach learner assessment execise book technology electric vs, instituts engineering electrical,,, drawing Diplomat math engineering science drawing

evaluation trade theory electrical engineering ,step dismental, step dimension works vs in AC machine theori instruction operational requirements algebraic, step qualifications rewinder vs council trade code ,trade minimum ,test resonement low ,test , occupation trade vs quality insurance Engineering , AC ,DC machine ,topic foundation, system ent level AC, vs NC's matric seignoy technical princy AC ,logic circuit math investigation quadratic exsry , input lecture output vs xircuy, trade scht vs code tender instruct,vs Engineering ,code trade minimum, knki manufacture batterycorrect , constructeur installaty circuits grade safety technologie ,nsaaa step work daily acti understaking material package mainty , assembly panel, labelling battery AC , DC, cabling soldering control competu compagy phase ,

- nated base Norton the venin network, resistance parole series start parallel start delta reseat ,advanced field ,dial Deer distributysystem substation vs basic sub station trade VCC,ICC advance physics chemistry engineering ..

Memorise ,torrseafy advai field but work week basic field electrical under going research ,

- scope diplot vs advance field dhet machine transistay curixuy phase policy mathematic asic field d,
- component job institutor low fundamental AC research AC research ,package low degree ,saqa n6,nqf7,78, degree technoy electrical outcom news , understand experience component didacy AC, DC,psychometric pedagic ,
- evaluation saqa memorise evaluation prep trade test vs. monorise vs memorendum test test circy literay,lecty learning ,Sawa meet reat lecture nated nated ,vs teach learner instity fundamental working compagny,

Engineering : scope work project.

Irregularite semesy policing Poe's award years self meet achieve textbook n submitted, 2000 award policy submitted papper for completed, previous papper discount.

-completed textbook information after achieve DC machine Levi transit advance systeme completed , resposable ,exam holiday memo vs saqa vs is chat to win court , Engineering city power tender to Portofilio low rules , Portofilio city power experimental job,Shoprite experience but sales documy wallets account treasury ..

- memorise nated instructywas to doing to rwiten ast no study buy opery theory , ciproc ,sars nated council business cooperation work nated lectt copyright and visit studi labour pliay permit to entry schot busit. Lose colrith process casebook ,sars calender busiys hool college in case with dhet deal .memorise markets textbook, memorise sale book sars commission property intellectual de register dhet high educare permit .policy exam national copyrith re mark book bibliogray reference number to mutch years ....
- proficy colrith educare education system note book didacty lesson plan course inventories research methods model lesson plan , business markt businey comments book note order project book, module week was not bring market scaling reproduction project learner

6.1. Assessment coverage DHET ,saqa council,,

Subjects :project assessment.. and career mentoring research coverage faculties completed module,

- project title : engineering national trade learner and lecture technical vocational department higher education examination national and qualification Framework national ,council trade and council engineering trade test question papper project modules explanation low rules exercise book, completed outcom project society.

.education construction and project bridge keeping stability journal thesis stability civil engineering,and mechanical engineering and electrical infractute

- psychopedagogie engineering civil outcom technologie ergonomic, ,

1.Project construction and project management,investigate wat key national road conduct study feasibility assess viability upgrading existing route and the construction of new or by pass route , investigation found freight, municipality area . Light

1.project description:

Extension from education n DHET Education to saqa council Education ways distance learning , infrastructure asset, a grade separated .

Strategies construction elimination abnormal educare loop ramp load , bridge .

Bridge Education,bridge substructure piled foundation abutumebt front Poste tensioned voided deck superstructure bulk ,design of layework make optimunmaterisj ,

- problem encounter and innovation,
- piling tender temporaries ,archeological ,

Pile cap, temporary deviations by pass, stop along , empower target,

- Project status: construct, chalkeny, inspection survey, safety educate.

-case study testing implications , to conduct to detail design in order a cuss road mining , accommodation up grade,

Client requirements, pavement,

Layout of trial section x,y lateral restraint ,increase nearing capacity creasing length of shear tension verification geogridr static plate load testing falling weighting deflectimeter were used to verify the effect of geosynthetic ,

- present research: traditional geosynthetic reinforced weakness subgrade and Normally increase ,penotometer testing engineer later works,

Project description: resultat from,pressure depth,project progress, strain material n/ mm , anchor tension force , equivenlent rigidr , flexible baseplate the propose construction programme duration.

- cross section bridge structure, beam seat, concrete panel facing , reinforced,select backfill ,common ,

Extraction of durability subcontract yield stress, ultimate stress MPa ,bridge abutment ..
Framework bmodern labour construction public work program leading to critiques of infractuture sector expand public b,construction maintain,
Council nomination, project layout structure ,, ,
- project description: test site capture data km track Struct deflecty railway train whelk linear teanst steel , position track structure, resultat discussed.
3.dhet mentoring:
Outcom career saqa maq

..education career mine geotechnical agreement Agricole sectorial engineering mining qualification authority mining and minerals sector
. understaking electrical material mining qualification career mine workforce.
Mining sector , why choose career in mining minerals sector, ,
Career mining choose a career how to make a career choice ,
Critical cross Feld skill required mining sector , problem identification and evaluation, problem mathematics literacy , planning career in the mining and mineral sector , wath career suite life choosing qualification, occupational categories technician trade workers ,machines operayorx mainstream career , understand qualifications, artisan career option mining minerals , career,, professional career ,laetber paths career ,financig your studies,,gold platinum metals ,diamond,coaj,cement line, jeweller ,extract petroleum and gases,service incident other ..
Bridge catergor

- keep bridge indentification number carer opportunities occupation framework occupation level n qf , occupation categories ,1,2,3 elementaire worker, machine operator,technicia trade , manager profrssy, production

-
-

<u>7.1 Purpose dhet : ,, Education input out put</u>
<u>Subject mining examination , safety health labour mining police. Outcom ,mining examinator national trade , explosion mine</u> , discrimination mine .
Trade AC ,DC, mine machinery.

.7.2. purpose nated career : bridge static stability briage movement phase periode frequency stable way phase to phase job Engineering lecture transition phase
- psychomotor job analt functionalite rate class hrv constructy woru saw building task tools must up date collective ,function real word student function machine student rule input output the class function rules teacher created spread , gradient a vector function gradient if scalar f (x,y (arrange partyah, stability construction isostaique diagram force structure hyperstaics beam ,regulation commissair,tools form stable trade nated engineering subject , assessment task build ,mark allocation ,content average , asservissemnt tools ,point balance framework structure stability..
- instability systeme development bridge statement periodic 3 month way key learner break time table semmester maintained up grade up date .
. Teaching plan daily underplani g phase foubda phase intermediate seignor, staff lecture ,junior seignor principal lecturer Engineering traine circulum vocational subject . Time table general signal linearized x (t). Control didactic process machine key learner input out put loop variable subject x = ,y = y (s(x) discretion signal temp , instant ,energy power time continue R+ 1 , jx ,power ,,
- transformer Fourier control didactic time table x t , r+ 2 dt , counter measure frequency content sum , property x(Q) + ,,property lineaire time table input output , real time table ,,derivation note time table dx = St , TF (St) ,, integra, impulsion diract time table uniform impulsion retenttion xt expent time table ,, complexity time table loop ,
- transformer Fourier TD ✓ (x,y) , ,filtre lineare box lineare circuit transfer input output (s) , x (t) ..
- regime transitaire learner phase and teach system linear u (t) system education stable sponement stat equilibrium means system input out put loop Kirchoff constants transmittance , signal course modulation module week output modules course type trade phase -test readiness
b.test scale maps distance learning corresponding learner concept distance learning graphic scaling size generating km learner distance , scale weigh learner grade real m square space scal factor point ,accuracy mesure survey , degrees latitu ,geodesie projection cartographic board coniaye,, isometric learner plan circulum ,latitude circulum implentation,perimeter circulum schema sequence circulum phase , transformation coordinator geographic circulum policy real engineering, longitudinal meridian ,exposant projection,constant projection p,coirdinat projection examination circuit dhet vs qctovs saqa scale ..
- probably..
-movement phase vibration force oscillator learner, input out
-Low rules of conservation of energy learner circulum policy, engineering move mechanical kinematic energybkEvwork done conservation force ,step determiner system Education , potential conservation input out put teacher , kE1+PEi= kEf+PEf ,step 4 , step phenomen bbeam energy breag,,

Efficient learner ,useful energy or work output ,total energy input, transformer per phase energy phase learner,,
Activity learner device home work scall effici, process kinetic calculate gravi learning linear mecanic,
Frequency constant capacity static displaced,resonance frequency learner materit Curie ,Piezo electric voltage,,
- robot dynamics kinematic control learning teach plant scare , position coordination lineare , circulum velocities Cartesian circulum move phase learn, rotation matrics activities passive rotation ,elementaire phase reprensatat, generality task space classic , body acceleration effectuator ,x y,z, angle ..language machine education funct ,from matric mild learner process ...
- induction learner error resource machine educau..matrix time table line colonel movement weekend months build key ..form work job career .form saqa form dhet ,for qcto language matrices movt 2week ,3 month ,12. ,2 years qualifications experience language matrices deployment years compared , circulum implentation to the college and instituts form moved record exam internal external time typiste record archfile statement certificate,and diploma..fabric system.

8.1 DHET, vs seta merseta sasseta training
Accreditation training,

8.2 Purpose: manufacture relate theory practical, components equipment,
- trade ton max,chain load diameter.
- trade ; code objectivity criteria.
-electrical testing instruments, safety and faulted find ,system multimeter insulator leakage tester phase rotation tester.
1.correct test reading all safety rules ,armored , make standard armoured cable up 16 mm sq core volt glandess ferrules and lugs use to manufacture specifications ,join to mechanical CA2, indentification rating current voltbCA4 terminal PVC cable up to 1209 entry into cable end viz using mechanical compression methode correct according sabs 0142,
- installation of machinery : install and level compressor motor a machine part on a fabricated base ,,
All safety aspect adhered to ,no damages to equipment,level withug ,,
Install commercial refrigeration system capacity 19kw refrigerator include pipe work according

drawing specific ,single phase induction motor ,phase squirrels cage induction ,rotation correct ,correct ,,trade fault fault fa control find , control panel and motor control all safety aspect adhered sabs , correct test ..
Vs .
1.2. Circulum extra subject electrical energy , industrial electrical ,electronic
Engineering trade theory vs practical
Module energy renewable.
Electrotech.
-thermoelectrical cooling , Peltier low relate manufacture.
Cooling air conditioning modules, technical controller product , coefficient of performance,thermal design, DC current vs technical power supply type,
- recommandation of the manufacturer , comparison of two technical controllers ,,linear vs amps ,,I/ max derive dt ,25 k ,0- 0,33 , I/IMAX should middle , 0,33 -0,66 x IMAX ,, coefficient of performance (cop) ,, .. performance vs current, maximum temperature,warm ,cold ,is increased , thermal design,is crucial allowed ,
-thermal design , performance of system, reducing optimise hear sink fan ,power losses isolates area , Peltier elements,,
Dissipation warm side ,Qg=QC+pel.
- I= 30 IMAX ..
-heat pumped vs current:,,I= 0,3 ,, I max ,AC)Qmax , ,,thermoelectric thermocontact cook eratiin DC vs pwrt , maintence ,
- recommand manufactt ,limity current ripple regulatit output ,
- ferrotec , 19 Perce, engineering controller DC curry case manufacture,,power compare..
- Comparasuon of two controller. , Stability to work.
- design process: thermoelectric, estimate heat load interactive test parameter is amount of heat absorption, power dissipation radiation , conversion conductive, dynamic (dQ/St load transfer ,choose Peltier elements ,,

-electrostaric ,electrodynamic, electromagnetic physic industrial electric engineering physics
Heat rejected vs current control play heath thermal hear sink estimate aths ,,
Performance vs current I/ max St heat pump,, heat pump vs current , Amax = Qc /0,25.
Temperature sensor ,object high precision ,power supply requirements.datasheet control information input

<u>9.1. Dhet vs ,seta merseta sasseta,vs saqa,</u>

9.2. Purpose: all the safety and policy
Defense civil and military safety outcom assessment.
Manufacture relate theory practice , engineering learning
- purpose STD 1285,, fuse holders ligthning arrester , electrostatic discy.
Scop commercial and military electronic devices required no stated merseta seta no status to section mandatory , gov gazette etc EIC sabs correct.
- application documents: sabs iec ,,general requirements sabs EIC mil norm ,
-D.3 functionalite marking :mil,sabs ,EIC sabs ,
- terminal identification: acquisition documents identify together functionalite line,load instrument ,
- other marking electrical diagram caution marking caution marking alignment marks, assembly instructions and other marking ,
- electrostatic protector confirm method where size limitations not accommodate all of the marking , requirements order of ,shall apply,
-identifying number sabs sans ,EIC in mil safety code trade CO1, ,, mil
-manufacture source code ,merseta mil ,name trademarks merseta sasseta seta. Mil STD , current rating when applicable ,date code when applicable , other rating and marking ,code method color coding telephone code , merseta colori,,
-Dc breakdown voltage shall be xolor coded ,dot accordance method , except that color circuit breaker,line a,b,c load a,b,c marked ,,main terminal break shall be marked vertical, accomodation letter , precedes , polarity thermo static switch FSC 5939 mil rotary sequence is counter clockwise visibility , acquisition ,open frame construction switch marked construct color pressed moldings , punch identification,
-toggle switches : toggle switch terminal marked in accordance, termination identification, identification push , contact arrangements symbol and terminal marking, single form normal open ,close ,,item specifical space contract number date serial code merseta ,,
- used unit pack bag and ,procuring activities physical space is not available mark mil used,
- designator for part assemblies : designation marking process to IEEE marked ,, sabs sans EIC mil
Reprocurement: contract contract , used assignment.
Details required.
Electron tubes: type designation or number type marking sab, ,labej mounted merseta seta sabs visible ,mil
- electrical electronics part printed wiring board marking mil STD 1285,,
-name plate data ,sabs article mil data confirming applied .. sasseta merseta sabs correct
- mil STD intended use ,issue of discuss,marking for shipping sabs, serial number sabs sabs merseta code mil ,air transportablr item , reprocurement sabs mil , subject term key listing ,name and caution plate, caution plate sabs merseta seta sasseta , mil STD , priority of identification information Assessment ,marking process,,
-drawing engineering code gage code format size letter mil sabs number system ,

- design activity gage code drawing numb army tank automatics tank wareent number sabs ,size cage code scale ,unit ,
- pin number length contractor manufacture item not change original,defense logistics battle explanation ,record accurate number number duplicate , responsabily Engineering transferring design from design to another ,sabs sasseta seta add cage original identity , maintain design activity activities b, manufacture,pin item meet ,tabulation assembly installation ,source control delineat ,,
- design synthesis : sabs merseta. , Mil

8.2 .Dhet ,vs sasseta seta accreditation, Assessment.
-mil STD , safety security training, merseta required.gov gazette,
Applicable ,: document , general engineering n studies electrical engineering.business studies, Government documents , specifications other government drawing engineering and Engineering science subject safe , order of priceden , definition commercial and government entities gage shelf , contains, design activity engineering electrical , documents ,, functionalite marking engineering electrical joint electronics type designation system engineering electrical subject n ,manufacture identification engineering n diploma , nati supply code for manufacture n engineering electrical trade merseta ,, nomenclature,order of procedt, part identifying number pin engineering, procedure instruction manufacture number ,set select drawing general requirements, government names join electronic type design system nomenclature ,army nomenclature binspection stamp ,special characters contractor entity gage identify marker equipment, except to table ,unique item small item ,limited multiple item , reference design government reprocurement, details required,type number and design,electron tube ,electronic printed wiring board name plate , marking battery circuit, marking labalk ,high voly notice , radioactive matery sabs merseta, ioning radiotion sabs , caution sabs , schematic wiring and cable sabs San IEC diagram , chassis identification, modification work numbers marksabs ,sensive electron device sabs IEC , sensive of marking ,general type number marking process ,wood sabs ,size labals sabs ,material radius corners mounting sabs ,spectral glass sabs IEC , opacity sabs EIC ,permanency durability sabs EIC , note usur did ,marking for , air transportable , .
-2..introduction system management,process , required analyt , functionalite analyy, verification, system engineering process, system and control breaker review trade studies ,modelling and simulation metric risk management.
Planning organising, system planing product and integrating system development,
-3 system engineering. Electrical teade

fundamental introduct , subject , application work experience, definition, facility ground system:
- power distriy system sabs EIC to mil , communication system , bonding shielding and grounding relatship sabs ei. ..mil grounding safety practice sabs , ligthning discharge fault protection noise sabs sans , summary of requirements, resistance required sabs San,resistance to earth sabs sans department defense SANDF communication electronics requirements, typical resistive environment effect,neasyof soil resistivity,one electrode , subsystem ground burier gride sabs,resistance properties ,simple isolated vertical ,fLt potential,, ligthning protection, phenomenon ligthning influence ,strike holder structure less protection flash ,conductor impedance effect,inductor impeteaeth resistance ,basic fault protection fault protect ..
Vs
Saqa engineering electrical learning,advany maintence low voltage fault find , batteries,low voltage inspect service maintence battery charger , designing a lone renewal energy systems, design solar pump trouble shoot PLC,completed certificate competence , demonstrate understanding process communication system,control electrical network a control centre,spray wash energised high voltage network, fault find repaired DC power machine,operate on high voltage network ,select up generator for renewable energy ,fault find repaired electric system winder installaty ,construction
Area 7,
Electrical infrastructure level 3 area ,-
-inspect record report condition medium voltat station appropriate,test maintain high voltage isolator ,earth system, transformer, equipment ,commissy terminate ,,install commission terminate medium voltage joint medium cable dcmachine,mainten voltage switch gear ,,fault find system conveyor install ,mining fault,construction disment,overhead,special area chemical , interpretation State, maintence busbar and chamber association equipment traction substation, 3 kV DC traction regeneration traction inspection record ,breaker ..
--Vs ncv vocational isat frame activity
construction electric . Learner
Practical theory electric principal ,introduct ..

dhet , diplomat engineering electrical,, electrotech, militaire over , defense award challenge Assessment meet defense,,
Electrotech , select power of electrical appliances to achieve set temperature,carry calculation ,convert mechanical energy to electrical energy. , determined the amount energy

installation in termine kwh ,, determine cost installation AC ,cost incud , apply vasic magnetic theory, determine magnetic flux density for magnetic, interaction between magnetic field, AC lines of magnetic force ,flux MMF, interactive between current carrying Maxwell,non magnetic relative MMF ,motor left ,theory faults of switching,, determine energy stored,calculate length, principle, ,,compare diffentperiodi. Time form RMS value a stage,value maxitprak additional, explain singlt and three phase system comparison, voltage number calcutlind phase , demonstrate calcul diagram the operationel circuit, explain apply purely ,,explain effect having poorfactoe capacitor, AC penaltiecable size equipmt size current demand,running of induction motor on full load synchronouse static delta star , description transformer determine efficient no load components ,transfotcore ,type AC air breather conservation buchils ,core lamination , emergency stop button warning caution ,,state installation procedt consider all safety precautions application non service generator set , consider all safety ground condition state ventilation noise define refueling access, in AC commission the sets preparation insulation plant proving test suplyis correct installed,all cable are secure and correctly connected,the sets correct out electric ,state earth , connection from non service generator set switch gear equipmt AC check load cable and interconnected,checj the earth operate non service,identify generator,applyloD in accordance with safe working check and adjust generator set running ,mainy voltage ,shut down generator, carry out after use check in accordance completed recomat, maintence non service generator set maintain principal procedure,apply all safety equipment,install non service distribution system,install distribution cables,install distribution units feeder pillar mcv,rcz ,install operate and test ligthning and power distribution system lapds, statement design,ensure correct placement fixumaterial task, ensure task is installed to line,ensure task requirements adherapply electrical standard,ensure compliance with and enforce all regulatoriiij, evaluation thee executive m e electrician task , implementation safe work ,,
Selected appropriate switch gear ,determiner capacity switch gear install diagram,manufacture local distrtpoinr , manufacture data protection,shirt circuit, diversity, maxi demand,connected load ,selected type wire identify system ,determine adequate capacity basic , protect

Dhet ,vs saqa labour mine ,
-Purpose:for plant engineering examination the theoretical section subject,theory practical, Electrical,mechanical,,safety and management ,accident prevention ,fire protection risk control , project management,project financial loss control ,
- electrical technology, DC current machine.motor generator ,efficient DC machine efficient of DC alternating single three phase circuit transfo, production of rotation magnetic, character

synchronouse three phase inducttmoyor ,semi conductor ,electric lamp and illumination,electric power transmission,short circuit condition ,circuit breaker ,cable insulator overhead, power economic of power supply,maximum demand ,fault discrimination systemeteical fault ,illumination exploinsion equipment,,

- applied thermodynamics : air and gas compressor and blower,air motor refrigeration and property air condit,psycho entry ,steam generator ancillary ,heater balancing , balancing condensatir steam gas combustion heater transfer fuel transfer , simplestress, strain thin pressure vesell tension pression circular, close coiled shear force vending , temped ,strain second moment bendut shear foundation, fatigue mechanic,property,testing material twisting shaft property, reinforced Crete, conveyor wind plant ,elevator traction ,motion , displacement and acceleration,static dynamic ,belt and chain ,brake dynamic, toihead gear train lubrufian clutch cranes bearinghydrattransmissiin flow friction losses,material transmission pipe line ,Pelton wheel,flow in kaudnes, hydraulic machine ,mecanic measure air flow,dusting property, Commission safety maintenance condition.

- planing and commission of project maintence schema fire detection system accident investigation, testing and repair electric motor phasing and synchronous AC motor operating tandem fault discrimination electrical,hydrastaic drivers classic sequence general, dust suppression,emission control flameproof,boiler inspection repair inspection vrsei unders pressure, maintence fault diagnosis compression refrigerator and air conditioning ventilation system steam pipes water traps ,steel rope inspection application type,

10.2 DHET, qcto scope, saqa sasseta.

Outcome,

-10.2.1PURPOSE: engineering science, module completed, algebraic linear basic foindamental system process fabric learner engineering science , theory theorem fundamental research,step task

Learner lesson plan lecture plan mapping investigation analyse input out put subject module assessment

f=ma+mg, v=u+at, p=wx.t, Fu= ft, heat = m.a .cxt , equation algebraic linearing exponent , Ax + by=o,,ax.ax b.b y=,,

-fa.a +F.b.b , fa.a+FB.b=c.c(x+a) exp .n

Subject Engineering electrical applied

---mathematics ,(1+x) exp n=1,--+ Engineering science g= ma + mg , v=u+at, p=w.t , Fu= f/t, heat = m a.x .c t2-t#,

Engineering draw .. orthographic orthopedagogic educare education,care function.
- industrial electronics, v= r.i , e= v+ r.i..theorem equation loop ,
Trade theory v= r.i, e= v+ r.i , // term 1,2,3,90 days, ///mark score point 100 mark,////inspect policy stolen excy//// recalculate error developm theory inventory motion low formula pedagogie fundamental engineering phenomenon low motion ,

Exchange policy investigation resolve framey regulatority engineering compliance crime vehicle ass license number low, step collationing crime information legal paray, crime source information identifying crime described crime analyse crime ,crime no protect over load identity module subject completed source and need ,design analyse feedback criminals trade theory safety .
-engineering safety engineering completed design creation components safety management prevention low warning protection device incidey hazay acciy ,sab sans regulatory low motion F= ma+mg// Engineering labour ,inspect labour Education levy coid works relation collection misconduct fault award ruling compensation frame accidt ,F>ma+mg,,/// engineering policy framework regulatority implentation legislation informed. Claim assess indentify claim avai procedure case f= ma+mg,, complain f>ma+mg,,
- test trade vs test dhet nated class question theory test ,
Test score mark subject, mathematics , engineering science, industrial elecy, electronical ,total value test engineering y/ evidence low given explanation low low rules limited Lim n (1+1/n) exp n ,, Lim -b +- b+4ac/# a..,,Dy/DX= 4x+3/2x+2.. into..., F=g.ma.mb/br#, p=rl stregy module elast ,fa= FB,/// vc ,vr,r#,r3,r3 Kirchoff northon , //// evidence Poe s resonning comparison test value test improper integral ,test converge diverge limited More ,less Rieman ,we not also define the integral as the limit as Delta x for to o of the genersj limit goes to infiny how does bound it self ln (2+ x) in this case delta x still equals 5 / n but x I = an integi calculator give resuy,compare force low motion gravity attract,compare test two frequency,compare two load transmission value //// evidence low quotient evidence judgement entry low exhibition limited

fract of low rule ,value add ,task requirements logic low value,operator task compare two value force operator mass gravitational limited sum,evidence low lineare limited factorisation,compare two task , , Engineering council.
- visa trade qualificay answer passport, investigation planning system undergo, mathematics, requirements test trade module limited derivation function ,integray function master number rewui factorisation, equation word ,,
-engineering science, engineering physics required test physic: module static kinematics mass force, gravitational heater power motion optique , strength material ,hydray
-,electro required , AC machine components resistor semie conduct insulator ,diode rectifier half electronics ,
E,,trade test require ,basic advance filling ,
Total faculty regularity, and irregularilarity extra classes.
.--1.2
Saqa labal supply Ras nominal 230 v AC sans , wiring is 732 code practice electrical wiring installay is residence ,guide for marking of insulated ,
- electrical machinery regulation learning objectives,sans portable tools , clause council , Framework, equipment ,metal work, sabs 767 earth leakage protect , wound transformer secondary unearth sabs 743 ,high frequency generator ,, switch marked clearly user to maintain in a serviceable conditions , chief inspector performance prescrib testing manufacture of electrical machinery, qualifications experience,earning

10.3. Purpose: dhet nationt trade n engineering electrical,, fundamental engineering level and License trade engineering electrical professional council .. engineering electrical science engineering, mechanical engineering
engineering electrical ,
- compare low test methode two motion Hopkinson , indentify shunt machine or more system learner low evidence low , v = applied voltage output power GI =1.V1 generator ,input power of motor M = (I2) , I1+I2,
An ,n = efficient of machine output power,zm*= n (I2+I2).v= input power of G,out power of G = n x input , n,= √I1/I1+2, armature ,total loss generation, à losses irons for generation , n= (I1+I2)v- Pm/(I1+I2)V..,
E1=V-Ia.Ra,,E1/E2=$.N2/$1, Serie motor two motor load ,,E a ,E b, . mechanical couple, motion angulair velocity transitaire permanent current power lineare two system , grouped generation pilote ,two transformation load or more system , resistance,, enclosed area learner Learner motion engineering trade

- phasor diagram total system complex wave transmit generator, fundamental results , maximum amplitude equation ration , learner,
- e1= Em.sin 2w.t, ,e2= k2.Em.sin 2.wt,,,e3=k3.Em.sin . 3 wt,, en =kn.Em.sin.wt,,,value wave algebraic sum fundamental and harmonic,,e=e2+e2+e3+....+en
=Em (sinwt+k2.sin2wt+k3.sin3 et...k sin wt ,, diagram connected balanced load 4 wire ,load is vector,z 1=Z2=Z3=Z3= z ,, Ena=Enb=Enc,,ENA= EP<o degree, I 2=ENA/Z2= EP,, ENB=Ep-120,,0I2,I3,,, ,,I 3,ENC/z,,,IN=I1+I2+I3=0,,
ENA=E2,/√3,, z= 15+j..impedance ohm . inductance,
-speed control calculation, E=V-Ia.Ra..N=V+Is.Ra/K.$ armature full load, ,
-electrical engineering advanced basic load system continue learning professional,
: sinus quantity voltage in form ,,U= u.o2.cis(wt) and current I=Io2 cos (wt+j),,
P=U.I= U.o2.cos(wt).Io2.cos(wt+j)
=U.o2.Io2.cos(wt).(wt+j)., U.2.Io cos(wt).(wt)..(wt.j)(wt.j).),,
P, sinusoidal wave,U1=U1.02.cos(wt+j1,,
Layout fresnel , V1=Vo2 .cos.(wt)..v2= vo.cos (wt-2p/3),,v3 = Vo# cos (wt-4p/3),, derivation integration sinus wave phase shift instaneouse average P= p,1/T.iny TD.pd energy effective recovery work heater,power reactive apparent , Q= u.i.sinj,,car,,Q= o.s2-p3,vectorial, inductance, process give voltage node distribution,, I1=j2-j3, I1,I3,I2,,j #,j2,,,I2=j3-j2,,I3=j2+j2,, ok,,balance sinus 3 phase network ,P= P1+P2+P3,, P= v I1+v2.i2+v3.i3
Power factor active reactive apparent, P=u.i= p+jq

P1.=v.i.(cosj+cos(2wt+j))..
P2=v.(cosj+cos(2wt+j-4p/3)
P3=v.i(cosj+cos(2wt+j-8p/3)
P=<p>=<p@+p2+p+3=<p1>+<p2><P3><,P=3.v.i cos j6.(s) Fresnel,,single phase practical load transfo area , synchronouse motor inte Maxwell Stoke magnetic volume toruf reluctance Kapp hypothesis manufacture motor ,e= NDT/St,, m= cmh
. operationel balance,ms ,loss ,Lenz low,

Low rules assessment is rules,
1/z = ,1/r= impedance resistance alternating ,1/g conductance,1/g,,1/l,1/c ,, sirmence

conductor , low Assessment reaction magnetic load learning relation resistance system became impedance or impedance become reactance parallel load resonance systeme load charging, discharge , QC , system stability learning assessment, magnetic demanetismloe, rules engineering compare ,loop,,triangle delta Serie parallel, effect phenomenon
P

, practical work measure: , single phase transformer magnetic excitation field magny , vector denote H created moving electrical charge,Amper H= rot H,=<j Maxwell relation of Stokes integra countiur ,into A.dl= .into.iny rot A.ds,,into c HDL= into.int .d.s magnetic medium, vacuum herin,, B= u.oH,,uo=4.o.10 exp -7, Hm-@,,B=u.o excited,H=B/u°, dimension M and relation, reluctance magnetic, direction flux ..int c.H.dl=into.int.int j.dd=Ni=HL,,denote,€=N.I= into .CDL= into contour , magnetic ,,€=S+N.I = A., N.i=(l-e).B/u,, ferromagnetic to H=o permanent Curie,u+e=r.i , u =Ndj/dt from ,converter equation N@.I2+N3,in primary r@=o,u@=-e=N#.dj/dt, ,i2/I#, perfect tfo=P#=P2.A#,,U#=Z2.I#..complex ,energy balance active ,, power in out speed characteristics,e (I), u= nominal, I: ,,loss= r.i.i+r.ie,p2.j.u,,U=E+R tot , ,
- AC machine engineering creation of rotation fields a magnetic in space at angular rotation w at le blanc theorem a coil of ax by current ,I(t)=i.2.cos (w.t),, i.2.cos (w.t) create a magnetic excitation field ,m .H.H (t), m = complex from I(t).H. , velocity H.H. constant (t) angular velocity cos(w), Ferraris theorem create rotation winding , I1(I).1.2.3,,i2(t),H#,H3,H,3,,2 cos() 1.2 cos () 1t= Uwcos()1+,spaced regularly three could sinusoidal curen w balancing speed, speed synchronouse, bipolar,speed demonstrate Ms=60 rotate 300 rpm ,1
-operator power balance engine, P= r.i,,P= 3.u.i,,
P=3.u.i.cos.j+u.i.u.s.u. ,.p=w.G,,
P=wG+u
I.P.3.U.U.cosj.u, iron loss mecanicak ,3 phase balance,, principle operationel,
-F= into.iny .B.ds Lenz low, variation flux , E=j.f(w-w).e(ws-w).. Laplace force actions magnetic current ,DF=idlr.urB,electromotive force ,,e=DF/St,torque ,P= C.ms,,D's,,do=w.dw,, maximum power , dw.dp.
-low Faraday speed conductor,EMF,E= B.l.v , low la place f.em = B.I.l,, v- ,,pem = fem x = Bxl.l.E/b.l=E.I electromechanic batteries load resisu in magnetic field,,
-leroy design plate number
,sum asyny motor trade type
Type 90.l3,834030 IPP, cos 0,82, AV 220 A,7,5,,,Ks 1,8 Rd 79 yv 380 A, r/ Min 1410 ,is class F ,Amb C degree 40,

mark of motor ,type 90 LS,
LS : letter of the series, 90 = heigh axe ,stand 56, to 100
Number of Serie : 834039,
 protection indices : IP 44, 4 protection body solide more 1 m, protection out delivery motor 1,8kw,power factor (0,82) reaction,V = 230 delta ,star current 7,5 efficient 79% level speed rotation vrm , S 2 service in S 1= 100%, S#, 60%, class insulator (A104 degree ,s = 80%, t max exploration 24 kg ,speed torque inerrie monimerric,,,
-charasteristics Puli g, fear reduce treil kR= 60, 0,85,,1450 Min , diameter of axe d=20mm effective treuul calcul pump MD.D/4 ..kg.m.m
Pe=Q.g.h/1000.n..w,w=Fxl,,F=M.g,,wur=M.g.g...w sex Put =wur/t,,loss mec,= c mec.nex,,CA.cc=JD/dt..E=B.l.v,,Fem=b.il,,,,- motor power apparently,,S=E.I.√3,,power active P=,,Q=√s.s-pp,,,...XC=E.E/Q,,c=1/2π.fxc,,Ng=ns-n,,,
-energie use / energy consup ,, efficient machine,w2/w1,,, efficy,= power use/ power consumption,,,,power motor = work/ Tim = force displacement/time,,
-peak - to- peak, 2 peak, maximum=0,5 .peak to peak,average ,0,637,maxm ,1,57,,RMS effective=0,0707, maximum 1,414 , averaged,..

-citcuit RLC loop,source e1(t)..
L.ddl/dt+Rdt/dt+1/c1=dv/dt..
-Engineering electrical : learning
 motoring DC command power circuit start connection command start with star deltat ..
, Power fuse f,control transformation,contactor f over load km ,relay k, control button ,time ,motor optional accessories phase, fault relay,ammeter , start delta switch power circuit starting with start Delta switch note out put ,220,75 HP, 125 HP and protection, control transformer,K2,k2.k3, contactor , overload relay,control option accessories,phase operating on dual ,220/380v, 380/660, 440/760 connection y. Star connected reduced ,load restive torque, Circuit breakers,n = operation time load constant load max, maximum temperature,time,time at rest max , maximum attend load loss cycle duration,time starting access,loss cycle, starting of electric break ,time sequence, Duty..
Development system

- advance power distribution system drawing note,
Provide electrical interlock with S1 breaker km1,class if S1, is open ,S1 control class unit mkm1 is close key interlock a show,provide kmb, f1a key interlock generator breaker GB,provide priority load shed control for feeder breakers in us,f1A switch gears provide interlock,GB to able operationel,when no priority load , provide diagram breakers switch gear with dti trip unit including zone selective interlock and arc flash reduced maintence, provide remote touche screen maitaunancd tip unit communication part ehernel gate variable,end arch flash ,,
- design fault value mms symmetrical,value,I= symetrical RMS current,IP= peak current,e=2,7,w=2pf,f= frequency,time,breaking rated maximum interrupted,150 kv,50!,500

mva rated ,
18kA at 15kv maximum, interruptions of 23kA, 18kax 1.30) at @1.5kv(15kv divided, vacuum interrupted,metal clad ,
IEEE ,
-Check capabilities, 13,8kv x/R=15, 13,8 kV,, primary transfo, 3750, 4,16 secondary,,4,16,, selected breake
System base z=3,75MVA/375MVA=0,01 Pu,,1%,,,
R=z/√x.x/R.R+1=1/√15+1=0,066%,,,X=x/R(R)=15x0,066=99%,,tfo stand 55,% impedance +-7,5,,
Transformer: full load. 31,000,no load,load losses, xR..x/RB,
- phase fault i3 phase = E/x,base current IB=3,75MVA/√3.4.16=0,52,,, system x/R,,
I1/x=0,52/0064,, x
- line to ground i.o multiple fact short circuit duty is 8,6KA sym ,phase fault
I@ ,,IlG=3(0,52)/0,055=9,9
- fault calculate check breaker application generator busbar system generated is
7,5MVA,4,16Kv,, 1040A full load IB= 1.04kA sub transient, xd' =11, x=0,11, gene x/ R,
1/X's=1/x+1/x+1/x=3/x,,1/RS=1/R+1/R+1/R,,=3/R,,xsb,,I b ASE phased,,3(1,04)/0,11=28,4
symetrical,E/x Amper ,system x/E of 30 short circuit duty ,,
- breaker type 50vcp,/ v max 4,76 kV at 29 kA max ki// 4,16kc per volt,,,,

. purpose.
wiring electrician ,wire way premise,
-network protection line , fuse , commutation,induction, network ,filtre, cable terminate motor ,,
Cable motor blonde for conductor heart join ,PVC wire copper ,insulator conductor PVC, colour ,control switch , .
Current assignment conductor p2= uxix h,,p2=uxlxcos,,l= m light conductor,A= section m,,z= conductivity ,coper z,Au increase decrease voltage ,zx increase impedance load conductor section across area conductor ,
, Commutation ,command synoptic system panel design panel order component panel,,
-program action ,switch interrupted,,logic circuit control diagram sequential,,
algorithm,logigram control gate grafcett , algorithm initial start end , circuit principle ,power ,
-command electronics ac motor 3phase , rectifier, insulator 410 , ,,2000kw,4000v,
8poles,ECo=1800,loss heater, voltage supply rotor ,E=s.Rco=0,222×1800v=400v voltage out DC rectifier ,Ed= 2,35,,E=1,35×400=540v,current DC circuit intermediate ,I'd
loss ..Pr/Es=22800/540=422A,,IRM= IR=0,816Od=0,816×422=344A, form facty angle,

amplitude wave, En = 2,35Et.cos π, En=-540v,=1,35×480cos π,,,,π=146,4 degree ,,,line current 480 V rectangular amplitude, 422,RMs,,I=0,816,I'd=0,816×422=344,, --- current transformer water ,RMS,,I2=480v/4160×344A=40A,,.,,
-Motor rotor 3000h ,4160,900r/m,60hz, pump connected voltage 4160v bogie open 1800v,transfo 3 phase connection insulator motor developed 800kw ,speed ,700r/Min ,, s=ns-n/ms=900-700/900=0,222, water ,110,
Design diagram:

Motor AC squirel power nominal of 25hp 1760/Min ,480v ,60hz, 18A cyclo convert ,200v,60hz,gate cycle ,VRM supply,Ea4=14,5HZ/60hzx480v=1160v,, efficient,= 14,5hz/60×1800 r/Min =435 r/Min,, voltage Crete order wave factor ,,max convert voltage , E a =1,35 E cos π, 54,5 degree..
- machine AC DC transformer open lab system game completed module workshop test practical didactic panel experimental
Rotor board 60 mm/, 8 tr,coil 1,5 mm,2 pole ,20 ,total slot shoss,,
test speed , power 100-240VAC, 50/60HZ, means vac / vdc0-65 v, IAC / iDC: 0-20A, speed ,0-400rpm ,40Hz ,0-600 rpm ,60hz ,rheostat rn4x250 ohnm ,80w condensatir 3×80 ,v rheostat ,simulator,,
-molding construction D: 900×700×930 mm, stator - rotor molding,
- expiremental voltage out +15 VCC,1 a protection short circuit 12 VC,24 VC, generator sequence amplitude 5 v Freq

,1 Hz to 1khz , generator variable logic true false , 30 v, tracking,fixe double charged, current Audio signal,
- MOSFETs control motor Serie universal command,
Motor generator: principal 12 v,3000 rpm,1,2A, 3,2 cm charge sustract multiplexer,logic numerical ,4 and (2 input) and ,3 output ,12 and ,input,4 and (4 input) , 12 diode silicone, 8 resistance ,5icc, study ram random access memory flic flop , timer ,stockagr information pan el 4+4 buffer , 3 step scale registrar ,buffer ,8 bits , decoder of 4, to 10 line ,ram ,, 1024× 4 display hexadecimal analogic ,8 bit convertors,a 8 bit ,potent 10v source , bistable demultiplex ,4 flip ,compare ,4 cannot register,
- calcul arithmetic ,16 logic arithmetic, 16 logic ,4 bib ,comptor ,decoder EPROM,8 send led level ,lineare discret amplifier relay ,cablagr structure cabling, test execution system mesure network wi Fi transmission 54 MBS,16 DM ,,
Engineering therapeutic,multimeter ,3 and 4 ,voltage cc,400 MV,4 autorage, oscillator double ,automatic, ,

- energy balance 10 bar ,400 degree, super heat , generator 1500 kWh DW/dt,,o,5 conservation Δu=Q,,
m(u2-u1)+mg(z2-z1)+1/2.m(v2.v2-v1v1) kinetic , into dv ,pva entaphhy ,m(h2-h2)= Q, Δ

H+ΔPE+ΔkE=W, w = into P.dv,,w = PAV.. = 1×10 exp 5 n/m (264-1,69).= 95kj/s, force derivation force conservation Vector F= grad vect .EP , S= sum Q1,
Energy balance thermodynamics, W= m(H2-H1), 1/3 mg(v2-v1/a,,=
T 1=100 degree ,P1= 1 barb,V1 = 1,69m,,,

Mechanical design process..

-calculation copper cm cubic concentrator sodium mol / DM cube ,,2c+ 4,l---Cu2I2+I2,,,I ,
Mineral composition ,mineral , formula,composition ,
LF
..

11. 2. Dhet vs saqa qct ,,
Practical work experience lab workshop,workplace industrial compG y trade
Purpose machine manufacturers.

- Namenclature and nameplate information ,DC motor theory, disassembly and inspection,testing, armature, commutator,frames, ventilation and accesoir,motor assembly and final testing,on site troubleshooting,faillure analyse ,carbon,brushes c,current , density and performance, installation,startups d baseline information, operationel monitoring and maintancd motor and baseline installation data ,,how to read motor. Nameplate,motor storage , how to rewinding ,140step disassembly motor wipe off ,remove the motor take motor , tips namel nylon and polythane .magnet wire electric motor insulation papper, utility knife wire cutter ,flate blade screwddiy

pliers,lint free cloth aorkglo e,
, Motor rewinding process, remove winding , remove insulation papper clean housing,burn out tenant of insulator, prepare new winding ,insert new insulation papper burn out of insulation,prepare new winding on a spool,insert new insulation,papper house the housing ,solder and insulate winding end , tie solder varnish wind reassembly motor test, analyse 3 phase ,3000,rpm magnetic field ,motor board ,motor inscription board ,motor nominal volty, nominal,of rotation,R +* frame1,5 ,calculation parameter new winding Diameter internal ,external .mm cylinder slot, package dimension of iron core ,measure length stator package IP 87mm,external diameter stator packy Dv =755mm number of stator gaps z=24,step calculation paramet,now measure dimenst of statorslot width of slot,b1=6,621mm,b2=8,5mm,heigy of stator slot,h=13,267mm,opening of stator slot Bo =2mm, height of slot neck a 1==0,641mm,toot width bz=3,984
Qu=π/B(b1.b1+b2.b2)+h/2(b1+b2)
e=Qu=πb.b/4+Hb..
-calculation number of poles= 60.f/ns=60.×50/300=1..speed, (2810),
-calculation poles step , T= π.S/2.p=3,14×75,5/2.1=118,53mm, pole step ,
-calculation poles surface, Qp= t.lp=11753.77=203211mm sa, calculate pole surface, heigh of lamel mm,type isolation ,papper lacaue,
Calculation the tooth length Hz= Hu+a@=B,#67+0,6712=@3,908m,,Hz - tooth length, Hu heigy of stator ,
- calculAtion height yoke stator , hj=1/2!Dv-D-2.hz)=1/2(128-75,5-2,13,908)=12342mm,hg heigh of the yoke,Dy external Disney,
Calculation the cross section of teeth of poles Qz = z.bz.iz/2.p=24.3981.80,04/2.#=38,237 cm Qz one tooth cross section,z number slot,bz width aualition of slot ,
Q4= π/8.(b1.b.#+b2)+h/2(b2+b2)=π/8(6,64) exp #+ (8,5)2+6,33/2(6,62+8,5)=93,4mm,
- calculate number of slots per pole an pole,aaq= z/2.pm= 24/2.1.3=4, number of slot per pole ,z= number of slot,
step in t = z / #.p=24/2.1=12, winding factor ,q 1 to 8, $ 2, $..
, Calculation of induction in teeth of stator ,Bz=Bzr , Qp/Az. Induction bzbzr induction in gao, calcul inductt yoke, bj ..Bzr.Ap/π .Qj =. 0,65.103.13/π.9.88=2,15T, induction stator yoke,bzr induction air gap, step calculation of magnetic flux pair poles ,d= Bzr .Q.p.10- exp 4/1.5 exp 7= o,oo427 e ,,
Flux magnetic per pole Webber,
- calcation of the numbers of turn phase W' = 0,22.uf.a./ d.f.e= 0,22.230./o,oo427.50.0,958=347,39, w calcul number turn , if phase voltage v , a number of parallels branch, flux magnetic,step calculation number of turn in site ,Su = 6.w/z = 6,247/27=62,75, 62 ,su calculation numby of turn fillings,
-calculation of cross section of the wire ,
wv=Qu.fu/su=93,4×0,34/62=0,512 mm,
wv cross secty of the wire Au= surface of slot, , dz=2.√wv/π..3.√0,512/3,14=0,807

1.Award degree diplomat:award degree diploma .1th,2th,3th,4th
NQF national qualifications frame work
NQF.,1,2,3,4,5,6,7,8 diplomat framework regulation documents bulletin subject
Documents Portofolio meeting sa saqa I'd standard criteria
Engineering electrical meeting in RDC leaving diploma bulletin, statement leaving .. instituts
Saqa exam award documents police criteria meeting
Documents, engineering n electrique
Purpose documents 24month
Working
Release :

Diploma certificate document submission high degree diploma
Consentence .consent purpose award degree diplomat certificate qualifications transcript subject meeting required
Requirements subject meeting .
2.Subject :no meeting diplomat national
Diploma national: n1,n2,n3,n4,n5,n6
Level 4, subject minum nated exam and trade test panel wiring
Documents Portofilio process nated
Isat process council
Nated exam :

,Statement resultat
Irregularilarity process final award degree diplomat .
School meeting qualifications process continues.
No meeting ..
Meeting school leavers
3. Outcomes national :

Requirements: task theory step input equation operation basic advance operationel mathematics system integration differential derivation fundamental low step system analyse system process fabrics investigate process device,
Δx.
DX/du=x exp (e expx+e/x)exp x

2, operationel equation input out system linear process force limited different fabric force , v.ra.

3 system equation input ration factories process force different Va vab
Task step system fundamental lineaire input force different x .v1=v2×t2/t1..DX/Dy

Subject. N.1,n6,. assessment task,mark allocation 310, content module. ,student week completed submit asssign, tools asssessor 100

Engineering practice 240 ,24 month cabling join fridge armature ,busbar safety db , building

On Thu, 09 Feb 2023, 10:44 TSHINGOMBEKB TSHITADI, <tshingombekb@gmail.com> wrote:
1.National qualification frame work .nqf6
. engineering n electrique and teacher NQF 7, education technology
Subject
1.2 .Purpose :statement resultat:
Assessment :
Credit 120 ,field ,originator sgb,
Framework:
Criterion minum require scop maximum
Tools asssessment:
Entry award degree diploma originator ispt Kinshasa exeta it kitomesa inpp dr Congo math info unikin. No meeting / St peace college n engineering saqa ,
.. pursope engineering nqf evaluation
1.3.Tools assessment. Award diploma n
Assessment entry exhibition

Statement

Policy saqa
2.1.National diploma nated trade
Credit 0,5 certificate

Statement entry n 1award degree diploma saqa framework
Module
Policy department n diplomat engineering n 1,2,3,4,5,6 certificate
Module topic Portofolio
Statement
Implementation exam learner
Module n engineering subject :
Module 1,2,3,4,5,6,7,8, submitted textbook .submitted exam papper exercise assignment assessment

Lecons topics
Scal marks analyse
Lecture output resulta assessment
St peace college: textbook note on line
Completed week

Examinator national papper ,
Statement resultat outcom nated

Panel wiring

3..Careers education department research scientist bono work.
0utcome
Discovery

Council trade career / council engineering
-Institution fundamental theory practical graduat institute foreign career and college basically advance research

Trade test

Evidence low: difference reasoning test motion ,low required equation basic fundamentals operational plant mathematics integration differential derivation fund's .
Low task analysis system equation input output linear process force limited different integration, system fundamental experience.powersysyem electric shop precautions workshops electrical shop absolute, asssessor rubrics,

3.fault find and protected device device control sequence second low I stallation , components installer PVC ,conduct,metal conduit flexible low ,DEP low installation of equipment right tool ox clear safe verification installation,
4, investigation engineering electrical of the low task subject module ,
5, investigation fact in issue relevance admnise,
Investigation the function weighting of evidence function judge control of the jury market subject,,
6: analyse investigation design system requirements information required force engineering electrical subject module task operationel plant mathematics integration differential fundamental,
Lineare.
7.

Investigation principle criminal low and substantive due process rules admiss and relevance basic engineering electrical.
8.investigation evidence: collection are recovering crime processing method scene documents organisation processing crime final result sketch.
9.admbistration communication skills assessment stress skill engineering,
Information manage system ,
Framework regulatority legislation mandatory engineering power arrested civil implementation, delivery report anual engineering electrical l,
10.
Training security skill development registered assessor admnise progr engineering safety keeping documents inspection and power inspecteur offence and penalite..
Up electrique the assignment .
Criteria questions,poor behaviour,suffice,advance, excellent
Low integration police security framework
11.verification sasseta.
Durie development low power systems shop tools precautions workshops low rated investigation tpm engineering maintenance fire arm integration in crime scenario police framework regulatority legislation OSHA.. occupation health low find fault and protection device control circuit sequence second low sans installation components fault spark insulator cable low electrotech installation of equipment right tools clear,low motion investigation challenge admnise Fail corporate equation

Criminal low substation die process rules admnitrade low informer situation account process determine profitable methods scenario organisation processing sketches,,..
Low supply safety power regulatority..
13..low council engineering and council trade occupation safety step task creation case study.
Low visa permit work council practice verification EIC CEi power systems electrique linear

circuit lab DC power supply function work low stand size.motion low agreement,
14, trade association amendment trade operationel system integration foundamental step.input
Trae basic advance..
X work operationel factor empires product e exp x logarithmic activities x inconu add divided work exponential x inconu factor linear entry exhibition motion equation trade translate,electronic ,
Operationel engineering,
Test trade council engineering career.
15low examinator skill time table work permit admnitrade time ,time table week time allocation subject , assessment, assignment council trade mark allocation,permit content average 8working 6level 24subject,x work operationel x exp n products e logarithmic actually x work factory lineare derivative integration test low lineare x operatoire AC DC ciy assignment mark weeek ,week DX/Dy working labour allocation work step xEx logic n possibly competency rating evaluation licence
Permit permit mark allocayweek.sabs statem.
ln, vab(va-vb)
Motion low service ln logarithmic voltage Va -vb operationel compare suply resistor R2,decide by sum resistor Serie R1+R2 plus voltage total step compare difference ial gradients DX DT linear impedance operationel compare logarithmic expontiak, resistance production z impedance over r step parallel operationel permit trade design gn control switch ways to reduce voltage and decreasevoltagrn,,,trade generation equation load cabling equation lineare transmission linear load lineare

Tshingombe tshitadi fiston

Portofolio evidence low ,

Case study

Cover letter :

Tshingombe Tshitadi
engineering electrical
To
st peace college and city power
23 April, 2023
tshingombefiston@gmail.com
0725298946
yeoville, rsa
Dear Sir/Madam,

administrator training and resource humane

Sincerely, for my requested career outcome in academical 2 years training and examination theory and practical for subject curriculum assessment need t more practice in your company ,Courses engineering electrical Work Experience Title/Position city power training /st peace college training 02/2023 - Present , rsa engineering electrical visited work place training experimental Achievements/Tasks award degree diploma saqa/ award panel wiring electrical that my requested for completed experience in your departement and compagny solicite that

job for visited site experimental technology and science engineering experimental thank u for your complement and gratituid

Tshingombe Tshitadi

,

RESUME AND CVS

My Resu

Tshingombe Tshitadi

engineering electrical

engineering electrical implementation time table to job time company experimental trade

tshingombefiston@gmail.com

Phone Number

Education

Study Program

st peace college

10/2020 - Present

,

jhb r

Courses

engineering electrical

Work Experience

Title/Position

city power training /st peace college training

02/2023 - Present

,

rsa

engineering electrical visited work place training experimental

Achievements/Tasks

award degree diploma saqa/ award panel wiring electrical

Contact

:

0725298946

-

tshingombekb@gmail.com

Skills

panel wiring electrical

Personal Projects

engineering electrical visit st peace college/city power

(04/2023 - Present)

award certificate diploma / saqa n engineering

Organizations

st peace college / city power

(04/2023 - Present)

engineering electrical training trade engineering ,

Certificates

engineering electrical/ studies statement

(12/2022 - Present)

engineering subject n,1n,2n,3,n4,n5,n6 / saqa n diplomat studies final assessment and examination /

Languages

Assessment practical topic st peace college portofolio evidence low coverage . icass internal and external assessment : relate low circulum more to practical ,

Project week and allocation time table research : saqa suplementaire subject :

Research and project circular assessment visited city power,

Student St Peace college company education

Career outcome

Portfolio evidence low practice assessment engineer electrical, ca

Student name tshingombe:

Content

1. Scope: research implementation framework study trade theory practice engineering study time table assessment allocation implementation framework regulatory in government. City power and Eskom training center development infrastructure support training train training experimental student case study. Time table allocation research integrity subject outcome more. Department education dhet DBE and council trade assessment integrate

1.2.Abstract: knowledge student case study engineering design analysis investigation field: tendered time table trade ask factor in company overview in city power ,research experimental trade theory research training knowledge city power municipality: job Gauteng city approved I in power electrique metering house home basic,

Join venture government development Eskom commission entrepreneurs.
Labor health inspector electrique compliance merest manufacture.
Saps electrique engineering supply.sandf mil development system defense environment STD physical company security close tendered required safety security electrique factor

1.3 purpose: overview in developing company tendered city power supply:
Engineering electrical case study

1.4. Requirements,

Engineering electrical training time table integrity subject outcome theory license trade .license practice trade .anted test ride panel warming and learning level electrique principal license. Development subject written assessment circular time table self assessment peer assessment class work written projection case study anted module week student

1.5. Task.

Ask answers: theory practice visited plant operations experimental assessor in workplace labor. Questions asked analyze overview on subject working in developing training company, answers responsibility sector appropriate sole Consol working

Attendance was the factory trade theory regularity and irregularity in sector find material design in classes and sector find means industrial company relate manufacture majority and minority in power plant that means to Create a system to support the training. And support to attendance learner in power city more job opportunities.

1.6. Task

Ask questions power to integrate sector training was satisfactory in CVS to gate information for training

Power city metering customer need to trade customer technology outcome technology module trade theory education technology trade theory power education circular customer instruction metering customer service energy sale buyer energies electrique

1.*7. Step.*

Need to cost customer power factor theory company customer supply need tax value trade theory consumer supply appliance electrique metering cost maximum demand trade theory rate :

Technology invoice customer service energy to make system projection engineering trade theory implementation in demand factor in power city trade supply customer power factor to working training. Question answers overview.

Cost home house city appliance electrique rate . Geyser metering training tree phase, single phase metering asking to be implemented time table allocation trade theory

1.8 Operational support rendered

Government labor.

Government industrial.

To compliance Labor: electrique power factor test inspection compliance.

Time table allocation

Relation education labor technology

Test installation Electrique metering single phase .three-phase test trade certificate coca.

Checking inspection safety health

Machinery occupation health test

Design inspection

.

Description	Unit yes or not
Tender: supplies saps development load company manufacture in city power Saps student Time: information management system, performance system development Tom engineering St peace college Afric instituts police Practice work Reg : C0700401099 Sars vat :9237228238 Sasseta number: accreditation:111999691949 CHIETA : national certificate in electrical engineering level2,3,4.. Electrical infrastructure and building skills,electrical and building skills, electricak and control panel wiring, Merseta:17-QA/ACC/1311/17.mexhatronics level 3,3,air conditioning refrigerator vantilatiin fitter welding control instrument HVAC, hydraulic,, Nated n2,6,, mict ACC/2014/07/3188.. Computer NQF level, info technology systems,computer I'd exam	-47.2.requirement n diplomat engineering. ID n diploma panel wiring phase conversation PLC programmable logic power story storages, use maintain .graphic diagram design, St peace college outcome career generation power station and saqa award degree diplomat continue supplementary assessment student subject choose trascrip record no meeting engineering electrical diplomat dhet . Log activities company city power implementation visited day field manufacture technologies trade. Training - Interpretation drawing electric code graphic. Purpose. Assessment: explanatory electrical plan create electrical plant, Content, with is purpose benefit of electrical, metering city power and St Peace college workshop - How to draft an electrical. - Tip for making electrical plan, interconnection of different component and fixture to the system .in training cooperation. Visited - power line with details such as size voltage, rating, power transformer and winding, the main switch breaker and fused switch, - draft ,step layout scale drawing room ,cabinet ,step 2,plan it advance your electrical plan, step walk your pal building., tips for making electrical furniture light switches and

Saqa n diplomat;I'd 201911130002 Learner faculty CHIETA.sutudent certificate number:COM182609001. ID:2100002023812. I'd:2004007064381. Admission permit and examination time table.engineering study.50110002.. External exam: I'd number instituts college RegNo:2013/034490/07 Dhet no:2019/FE07/028 Dhet exam No:DDP1220/19/00130 Merseta No:17-QA/ACc/1250/16 External exam: Afric trading Sasseta creeditation 112999691946.. Registration dhet:2019/FE07/014 Merseta 17QR/ACC/1312/17. LP R/09/2017/07/0018. EW seta 2093-280525. LGRS-2093-200525.	electrical outlet, - Plan for additional outlets renovation, Amount table Lampe, yea, later, appliance wiring plan, -electrical plan legend Calling mounted light, duplex receptacle, telephone outlet switch. - Basic electrical plans, - Patients room electrical plan create your electric plan firm a patient, Basement wiring plan --when listings out item such a feeder breakers and wire size, for particular project piece of distribution equipment, Intern of electrical distribution, -schedules are often included switch board and panel board, drawing to list number of circuit breaker load feeder ,size and number of wire , Project Schedule usually expressed in tabuled, organised self explanation. -typical ref, legend and - build drawing s: Construction project is completed is revised drawing, created and submitted, constructor, high, any charge Initial design drawings. -Construction process completed. . -Electrical drawing and schematic. -designing installing troubleshooting electrical

Exam.899992880... Subject. Full.. 47.1.Requireded: operationel subject field saqa . seta implementation Saqa award certificate. Assessment conduct seta Saqa award diploma certificate n engineering.and St peace college training skill.mseta CHIETA.. development panel and control wiring Level engineering electrical.infracture development. Meeting saqa requireded I'd..no meeting statement skill development.id certificate award St peace college .db box outlet socket switch dol motor.transformer. Control instrument mechatronics, Career development city power graduat.implentation .career Continue trade skill supplementary trade meeting month trade . foreman ID: 258968 saqa commissioning domestic or commercial . ID: 10259 saqa fault find repair and maintenance tree phase , electrical engineering. ID : 263006 saqa ,demonstrating wiring of	system requirements use various, line represented. - design engineering and technician use schematics to build and troubleshooting -One line diagram: medium voltage switchgear one line diagramed, and power systems single diagram. Is often drawing flow of electric. Typical: major components in the power systems list system voltage, transformation impedance, interrupting rating and fault current just the basic .item -Drawing should be kept. - Main control room of a -switching operation by identifying feeders and the load they serve, - System voltage frequency phase and normal operating position line diagram, - For more detailed view of an electrical distribution system, three line diagrams is used phase polyphone a c, system drawings, connection. - Diagramed show distribution component such bus rise, bus plug, panel, board, transformer, small, branch circuit, drawing alarm, system, -schematic diagram Purpose: man schematic diagram emphasis circuit elements function relate components, series or parallel Found, inductor, diode, logic gate, fuses contact, switch, every circuit,

premise defining ID : 258937 ,install ,maintain low voltage,DB protection ID116466: inspection and circuit , ID: inspection and maintenance control and control panel and circuit , ID111388 :saqa electrical engineering and construction saqa I'd 67461: N3 code instruction category meeting ,A,B,C,.. Level2,3 ID : 258937..plant generation , distribution, construction mining chemical and energy sector, maintenant,DB, protection,electrical safety cleaning, --scope of work specifications.sans 10142, - circuit breaker ,isolator, contractor and relay ,install Db , inspection Db , ID10607, 10605,10634, - replace fault -ID 116434: control electric network from a control electrical . Centre sgb ,power plant .field manufacture engineering and manufacture. -Switch way panel wiring education technology. I'd ,electromechanic .electrotechnique .. teacher I'd .saqa .	-circuit breaker control schematic: Wiring diagram. Terminal for selection terminal, relay, load detector relay wiring diagram. -main purpose of a wiring diagram electrical circuit arrange, schematic diagram, - wiring diagram ,part , device terminal strip, appropriate number,letter,colore design,terminal and connection between the components are clearly,build repair , -Block diagram: reference input filter sum, controller actuator process plant, distribution, sensor, - arguably ,basic type of electrical drawings block, diagram, components of complex systems,form of block,internnected,block provide a conceptual, idée a process is completed, electrical, Symbol. Represent schema -logic Diagram: current gate and logic gate clock - Breaker failure relay logic diagram. Modern protective relays utilization diagram to represent complex circuit process .electrical. - Schedules. A build Electronics use soldering. And disordering. System...welding iron, solder, silver, or copper lead, desoldering, plug, outlet, cleaning disconnectorb, connector.printer circuit fabric film

	microship process. Silicon. Plastic molding... Fit recess .fit wiring .process... Control - Instrument method selector design metering process I Appointment of service provider supply St peace College and city power delivery component lab workshop part time table subject... -introduction global stage St Peace college. -Scopes of project: projection required supplies to purchase and deliver total, -Special condition component Subject module metering 4. Purpise documents. Budgets: a projection budgets St Peace college city power time table fee.burasary.close graduation interne ship fund student.gov -Quotation value tax (vat) project: _time frame project is to commence success bidder Firm price subject, name of the company

	quotation close Appliance and company subject. - Item description of good part number quantity Evaluation criterion (80/20). -request for quotation number -limitation to quote supply and delivery Item/ description of good //quart///price/// bid price RSA 001 /engineering electrical practice workshop projectile engineering open view lab test lab and workshop practical saga .duet training exam paper .seta. Assessment police //// amount estimation fee Total include .8modul x 24subject x3month 200 projection years amen's test experimental technology. Training integrity one project... -delivery period Specifications required for project: Registration saga assessor conduct certificate. Saga I'd institutes foreign. No meeting institutes accreditation saga decision. Admit /30-39 NC's. Total credit. -assessment policy IE099-IE00.regular internal, Saga decision 10105/14 advance diploma intermediary phase teacher. Conduct... .n1-n3 national certificate engineering studies. -N1: Saga ID6710, N2 saga ID 637375, N2 saga ID 67491...Entrance...

	I'd saga award diploma N ... Ncv assessment plan isat . 40.7.1.Subject.. assessment task test assignment internal external assignment .assessment tool. Marking memo rebruc ,,.. topics subject outcom. Topic 1,2,. ,time and marks allocation 1h marks...examination training training formal. ...training exam rwiten permit and time table practice exam days. Fundamental subject ..icass .time frame, asservissemnt activities, scope assessment term 3, suggestions allocation .analyse grode.. Isat integrity practice..time frame .allocation require .. 41.1..required city power vacancies Estimated ICT service Research inovation: -table of content . Graduate internship Training center employee.visitor student apprentiship visited education technology high school and trade development school skill training .trade education career outcom exhibition engineering education training. 1.city power vacance 2023.for officer special and variations use career opportunities. Training oppoy . Metering guyser. Light city .training engineering career. 1.1 How to apply for city power vacancies 2023... Student career granted. -meter reading submission: St peace college time

	table engineering electrical Portfolio evidence low consumer panel wiring customer and plant experience design cost power factor demand reader implementation in city power loop .. Interlock system. Training partnership test. Outcomes career student generation power station transmission trading. - City power workplace ready to light up career artisan engineering. - Name of profile - City power. -manager vacancy. -city power officer vacancy. -city power specialist... : 40.10...requirement: implementation --SAQA module award diplomat -Award diploma n.engineering electrical -Award instituts foreign decission saqa -registration .award saqa n1,2,3,4,5,6. -Award meet documents. -Assement assessor saqa conduct moderator I'd: 202001305040/20191130002

	Dhet exam nated: 201000203812/2004007064381/2011007434332.. 40.10.1 requireded of work experience logbook instructions programme code 5090840..national n diplomat.engineering studies electrical I'd :90674.engineering studies NQF level6, 360, credit saqa learner I'd 67043 national electrical engineering nqf .level6..learner name :tshingombe Tshitadi ,surname : Tshitadi Fiston. Number employeer : Details compagny St peace college city power: Name signature...

Check up	

To compliance Labor: electrique power factor test inspection compliance.

Time table allocation

Relation education labor technology

Test installation Electrique metering single phase .three-phase test trade certificate coca.

Checking inspection safety health

Machinery occupation health test

Design inspection

Tender: supplies saps development load company manufacture in city power

Saps student

Time: information management system, performance system development

Tom engineering

2.1.4 operational preliminary case study visited power city

Operational required:

Permit working tendered temporaries permit and license study council permit government homes affairs study permit foreign citizens plants permit, and RSA permit I'd and exam

Exam permit period passport visa tourism transport logistics student

Meeting

2.1.4.1. Permit allowed minimum job career student permit security in BTs training allocation minim job

Social work classification job government to allowed case study student trade exam to be experimental in the plant city power Eskom and government institutes labor department

Visa code trade booking exam I'd time table days and time 4subject

Permit legislation framework regulatory mandatory to more experience pass port visa student I'd asylum to to work and studies tourism in the plant

2.1.4.2. Questions factory ask/anew student was not allowed to trade in the plant and to be training in the plant for dangerous .labor insurance compensation and development social student have for more information was poor in the sector theory to gate more information and to overcome power city member employment to work exam practice together in national planning plant was no coming successful for students to allowed. student must drop CV in entrepreneurs and city power to be employ for training and gate information not for work outside but in the plant system no to work in time table allocation technology outcome student to work powerful in academic workshop

Student to research and work power city information metering geyser in the academic research time table academic time table electrical .and student

Can gate qualifications. Security reception more policy power city framework did allowed customer services to delivery more information only training center power city was allowed training.

2.1.4.3. Ask / answers. Factor permit

Pass port time table careers. Factor physical security Eskom close tendered required company security must be completed student security sassed accreditation school. And student seta number request for allowing

Student engineering assessment council engineering and trade council visa I'd permit student for trade exam.

Was Questions more with visa internal city power Eskom
Day visit rendered was not defined to student to working in government city power Eskom, search research system integration student circular assessment to work and find minimum granted for examination labor.
2.1.4.4 .CVS student city power and training trainer to delivery bill information system. Integrate job government student was alone by self explanatory no company tendered work partners with city power Eskom on visiting site student was not in site was dangerous place for health student working in higher voltage and irregularity students in the system . System need to trainer training appropriate job and faculty appropriate school power city in school development plant power city metering student in meeting plant, school collie Eskom commission. Department trade industries Industries Company in trade company examination engineering, engineering labor school in engineering
Electrique in commission class school generate
1.4.6 .student college assessment workshop workplace class work. Homework research engineering project process in field faculty research department research.
Ask/
2.1.4.6.1 Faculty allowed system engineering lab engineering.lab workshop engineering studies and library academic studies center assessment engineering. Permit engineering allowed engineering time table work engineering 4subject statement engineering case studies for projection cost trademarks was outcome technology.
Misconceptions faculty retention subject psychometric vocational career guidelines study engineering projects trade plant engineering analyze design investigation system .generation electrical magnetism generation transmission system anted CCTV , study material, building student experimental plant city power how plant was working
Tendered close time table n1, 2, 3,4,5,6 NQF /level subject in system continue basic advanced filing engineering fundamental system
. Circular system study must undergoing investigation principle low power.
.consumer power factor trade correction power module student more and company operational required
Gov manufacture relate sassed seta merest accreditation company trade to supply trade test making trading component equipment to sharp fit to step operate chisel mark . Engineering trade in the plants
Design system

2.1.4.6.2..government system national fund financial implications in system exam to more go sector .
.go development social worker union fund to student go visited.

Closed sector required minimum score
Inventory

12..4.6.3. Metering module trade theory electrique. Electrotech.electrotechnology resembles instrument measures. Information management system. Framework communication skill, mathematique engineering science outcome engineering electric .factor
Instrument ammpermeter voltmeter wattmeter cos.analogy.digital metering.
Transco metering low voltage .high voltage.
City power Eskom authentic district municipality job customer house building substation. Generation transmission. Transformation cabling sector basic home electric metering power geyser cost
Month consumer kWh indicator meter and coat price inventory
Customer registration number existing installation and customer metering number custom power meter square consumer planning wiring design custom:
Registered customer training sale air time and metering installation single phase and tree phase installation industrial installation. Customer
Municipality lighting road ways street municipality designing civil engineering power lighting switch ways system.

Trade light to implement bulb trading data system.
2.1.4.6.5. Metering implementation time table experimental generation transmission level and panel skill experimental in the system house home development to the plant training city power Eskom. Practice electrique engineering research academic switch ways design db box outlets socket award qualifications time table investigation switch ways circuit breaker motor investigation analyze design power factor to be re implantation in company city power Eskom commission entrepreneurs go implement to be working in system. Policy system academic sibs sans trade theory licensed

System information analysis engineering fundamental system process...
Communication system engineering electrical license term trade to be implemented in city power was installed

3.1.4 operational preliminary case study visited power city

Operational required:
Permit working tendered temporaries permit and license study council permit government homes affairs study permit foreign citizens plants permit, and RSA permit I'd and exam
Exam permit period passport visa tourism transport logistics student
Meeting

3.1.4.1. Permit allowed minimum job career student permit security in BTs training allocation minim job

Social work classification job government to allowed case study student trade exam to be experimental in the plant city power Eskom and government institutes labor department
Visa code trade booking exam I'd time table days and time 4subject
Permit legislation framework regulatory mandatory to more experience pass port visa student I'd asylum to to work and studies tourism in the plant

3.1.4.2. Questions factory ask/anew student was not allowed to trade in the plant and to be training in the plant for

dangerous .labor insurance compensation and development social student have for more information was poor in the sector theory to gate more information and to overcome power city member employment to work exam practice together in national planning plant was no coming successful for students to allowed. student must drop CV in entrepreneurs and city power to be employ for training and gate information not for work outside but in the plant system no to work in time table allocation technology outcome student to work powerful in academic workshop
Student to research and work power city information metering geyser in the academic research time table academic time table electrical .and student
Can gate qualifications. Security reception more policy power city framework did allowed customer services to delivery more information only training center power city was allowed training.

3.1.4.3. Ask / answers. Factor permit

Pass port time table careers. Factor physical security Eskom close tendered required company security must be completed student security sassed accreditation school. And student seta number request for allowing

Student engineering assessment council engineering and trade council visa I'd permit student for trade exam.

Was Questions more with visa internal city power Eskom

Day visit rendered was not defined to student to working in government city power Eskom, search research system integration student circular assessment to work and find minimum granted for examination labor.

3.1.4.4 .CVS student city power and training trainer to delivery bill information system. Integrate job government student was alone by self explanatory no company tendered work partners with city power Eskom on visiting site student was not in site was dangerous place for health student working in higher voltage and irregularity students in the system . System need to trainer training appropriate job and faculty appropriate school power city in school development plant power city metering student in meeting plant, school collie Eskom commission. Department trade industries company in trade company examination engineering, engineering labor school in engineering

Electrique in commission class school generate

3.1.4.6 .student college assessment workshop workplace class work. Homework research engineering project process in field faculty research department research.

Ask/

1.4.6.1 Faculty allowed system engineering lab engineering.lab workshop engineering studies and library academic studies center assessment engineering. Permit engineering allowed engineering time table work engineering 4subject statement engineering case studies for projection cost trademarks was outcome technology.

Misconceptions faculty retention subject psychometric vocational career guidelines study engineering projects trade plant engineering analyze design investigation system .generation electrical magnetism generation transmission system anted CCTV , study material, building student experimental plant city power how plant was working

Tendered close time table n1, 2, 3,4,5,6 NQF /level subject in system continue basic advanced filing engineering fundamental system

. Circular system study must undergoing investigation principle low power.

.consumer power factor trade correction power module student more and company operational required
Gov manufacture relate sassed seta merest accreditation company trade to supply trade test making trading component equipment to sharp fit to step operate chisel mark . Engineering trade in the plants
Design system
3.1.4.6.2..government system national fund financial implications in system exam to more go sector .
.go development social worker union fund to student go visited.

Closed sector required minimum score
Inventory

3.1.4.6.3. Metering module trade theory electrique. Electrotech.electrotechnology resembles instrument measures. Information management system. Framework communication skill, mathematique engineering science outcome engineering electric .factor
Instrument ammpermeter voltmeter wattmeter cos.analogy.digital metering.
Transco metering low voltage .high voltage.
City power Eskom authentic district municipality job customer house building substation. Generation transmission. Transformation cabling sector basic home electric metering power geyser cost
Month consumer kWh indicator meter and coat price inventory
Customer registration number existing installation and customer metering number custom power meter square consumer planning wiring design custom:
Registered customer training sale air time and metering installation single phase and tree phase installation industrial installation. Customer
Municipality lighting road ways street municipality designing civil engineering power lighting switch ways system.
Trade light to implement bulb trading data system.
3.1.4.6.5. Metering implementation time table experimental generation transmission level and panel skill experimental in the system house home development to the plant training city power Eskom. Practice electrique engineering research academic switch ways design db box outlets socket award qualifications time table investigation switch ways circuit breaker motor

investigation analyze design power factor to be re implantation in company city power Eskom commission entrepreneurs go implement to be working in system. Policy system academic sibs sans trade theory licensed
System information analysis engineering fundamental system process...
Communication system engineering electrical license term trade to be implemented in city power was installed.

Engineering electrical evidence collection guidelines recommend police and army police military... digital electronics item may have.compuyer .mobile devise laptop.record ammunition.place cushioning material comparison analysis prevent damage record manufacture serial number model found fire arm weapon . Examination item information. Personal contact.modeor disconnected from network Faraday bag main tenant power to devices d consultant digital forensics examination package items in butcher. Do not tape item. Exploitation mitigation.xollect USB device.dvd.xd gasman DNA examination.seaech cybercrime offender computer networking chat room phone explosion technology in order hack criminal's crime targeting computer intellectual property...
Police support to army operationel.principleoperation police rules low operationel environment.. Planning preparatory and assessing police operational planning execution asssessor.base man power mission police station detention cell operation enforcement compliance legal...strategies.policing. Laboratory support. Low enforcement patrol main power... function justice system...tools mark... enforcement low safety security engineering electrical safety management systems.patrolmainten working build management
Implications...
Tom police security city power and College training system.

Professional engineer electronics or electrical engineering... financial program.information use to generate information on pretermine object indicator. Description and information...visible policing crime investigation.specialised investigation.intelligencr information management protection VIP government security regulatority.static security.physical security system tiditechnical indicator technology...perusal registrar system police investigation director. Manual system. objective statement indicating.infrasture development structure plan respect work report is base saps project..

Project poling facility management to maintain. Control system. community service reporting cycle quarterly and responsibility crime investigation implementation responsibility office .the non proliferation of weapon mass destruction act 1993act no87 of 1993..police interviews scenario.... engineering electrical city power electrique metering scenario vs. appliance electrique metering time table low enforcement appliance fire arm appliance customer CCTV radio security customer security it PC cyber customer appliance TV radio bomb missing circuit network vs. city power trade challenge assessment police engineering electrical time table trade theory engineering low non according manufacture and related,

:

Engineering modules equation algebraic linearity exponential ax by...a square +bbsquare network.... engineering planing components.researxh advanced field generation ,skill explain, development skill components,science natural mathematique,device protection components , discovery ...

Engineering investigation resolve of crime framework regulatory engineering crime incidence...step collating crime information legal , crime source information ,indentity crime describe crime analyse.crime zone no protection over loa.identify plan subject completed source and need design describ analyse feed back trade safety...

Engineering understand code conducteur.reason .learner. Discovery...

Point reasoning. Question. Operationel.skill total achievable processes. Add value learner assessment...apply skill solution resolve problem...

Questionnaire point of process or accuracy. Evidence...expected response evidence appropriate division correct trade Engineering correct multiply,evidence copper is correct each line trade theory ...DC current equivenlent force emt.. Junction rules Kirchhoff rules potential rules RC circuit. Shock hazard, thermal hazard tree wire system...terminal voltage...

Key terms... instrument that's...

deflection...

Descrition	Unit yes not
Key equation terminal of single voltage source v terminal=sum -I re few=R1+R2+R3+RN	Value estimaton calculation

Sum = junction rules sum Lin =sum I out, loop rules, terminal voltage of voltage source in parallel v terminal, = r,-I sum courant. Time constant t=RC. .direct current current during charging of capacitor, I=£Re-try=Ioe-tRC... Charge on discharge capacitor q(t)=Qe-t,£ Electromotive force, EMF work done per charge keep..the voltage output of a device is called v terminal and v terminal=€-Ir...Rs =R1+R2+,,,,,, current resistance find low him Resistance resistivity length found area resistance wire , copper across... Electric power... P=v.t...p=vsquare/r.. battery to power supplies... Cost..cost = power rating in kWh x number of our it run x cost per kWh.. Home monthly cost appliance every day possible includ dryer.micriwave.tv back ..if does give power give the should. A current.any thing in the socket 220v ..socket is cheap on the power is how much.. electricity continued to increase efficiency to offset consumption.. energy saving are account up being cheaper... 4.2.DC courent direct current vs alternating current ac .. Battery products DC current batteries voltage EMF is constant constant current circuit capacitor store charge current from socket... If look voltage peak +170v decrease through 0 to -170 and rise value 170 really be 110-120 that actually average but peak really is about 170..0oscillating voltage product electrique field..electron response to this oscillating field and oscillating back and forth producing an oscillator curent in the circular.. Graph voltage as functions of time current this average value	

voltage from wall socket it know as the root mean square,or rms, average.voltage varies sinusoidal.positive as negative doing average..vrms=0,707Vo and Irma=0,707I.0.. Instant 0.606...serir parallel voltage supplied Series resistance equivenlent.parallele... Performance a mechanical inspection and reporting on motor transformation workshop... components main...connected...AC current...Phase diagram...ohmic resistance only v=r.i...I=sin.w.t in phase R..AC ..I=v.sin.w.t.dt..v.i=sin Wtl,,,current lags ..WL =2πfl=x inductive reactance integrated... Operator j with rotate a vector 90 degree in anticlockwise direction 2j=1,j=1... power triangle..S=P+jQ..s=p+jQ...apparent, a=v.i =>Power ...Q=Isqquare..... DC generation...VT=Ea-Iara voltage full load...ia equal is ,, speed e=d|/St=|p/60/n=PN/60.2|60...2flux pN/120..f=p.n/60 sinusoidal AC voltage of factor induced EMF Conductor=1.11xe=(1.11)x(2fluxf)=2.22..emf par volt per phase x no of turn 4.44 flux ..Contactor... Instrument. Magnetic equation deflection's=B.I.l.n deflection torque TD=force x perpendicular distance...a=lxb TD=TC ... Parallel movement must same.. Ish.rsh=I-im ..I=I'm(1+RM/Rsh... V=I'm(RM+Rse).. v=VM(1+Rse/RM..... e=d/dt(II)..... Power wath meter consumption torque balancing energy in the circuit is directed registered..speed increase ..phase error occurred phase difference pressure error temperature.creping TD=TC ..flux =[v.i.cos/(krp)(DM/dflux)=[kdM/dflux].P..k=kRp..p is power consumption..m mutual inductance.teta .instaneouse current in pressure coil resistance v=√2.v.sin.w.t insta voltage ..IP=√2.ip.sin w...average deflection . average deflection...	

Total	

9.provide contextual information established : in city power and St peace college students engineering electrical research implementation trainings appliances electrical fault guyser stove light outlet socket current power factor demand factor mettering customer trade . theory current power delivery to the customer and customer appliance requirements need to trade theory outcom system engineering electrical.true power real power factor regulation system information.metering control analogy digital system sale kWh .metering customer demand single phase tree phase industrial.domeatic .

Theory current state previously study trade theory to wiring db box mering client domestic appliances technology electrotechnolgy trade.

Certificate license test trade theory validation low real power factor

Reactance inductance impedance system metering challenge instrument controller metering reading cost 1@kwh,value1rand tax value certificate issue matter license code client mettering indicator trade metering . investigation sale .

9.8 compared resultant obtained statement visited investigation metering St peace college time table learning cost grade cost value time .need to verify by the college St peace engineering work study engineering works place workshop trade cost appliance time credit accreditation value and city power real time delivery and sale cost building real time consumer schedule.....

10. Title report should indicate.

11. Weak titles, strong title appliance electrique engineering electrical

Fundamental system .power...

:

4.2.1. Requirement appointment of plants engineering electrical consultant provision professional services city power and St peace College Anted statement engineering electrical

theory city municipal provincial infrastructure visit development projects case study topic Portfolio evidence.
4.1.2 Sub sector manufacture main tenant St Peace college engineering learner assessment outcome transmitted generation power station metering electricity electromagnetic career outcome to visit joint venture city power government.

4.1.2.1 Special IST mark application

_ Discipline mark application

_roads and traffic engineering, road and storm water pavement evaluation, road transportation and traffic impact access studies St Peace college .relation circular assessment traffic map design, _parking and access studies traffic management .traffuc police. Enforcement low .study material in assessor assignment engineering, tom,
Maintenance police technical support material advisor circular assessment guidelines study investigated principal.Nd information management system framework regulatory government Gazette act material design investigation city power with happened and methods research city power traffic registrar research engineer low traffic prevention low.
_structure and building cause ways, Culver's bridge community. Stability equivalent equipment policy maintenance design meetings breakdown in the plant system

_electrical: rural electrification substations, network protection and control design. Energy efficiency demand assessment development operational maintenance and tom repaired road traffic engine structure and building criterion plan
-demonstrate
-relevant experience key personnel
- Bidder experimental skill methodology
-total point
-criterion professional liability insurance R3m for each and every insurance methods research qualifications and roles of each staff

2. Implementation framework regulatory legislation mandatory engineering electrical case study circular time table in visited work components innovation CVS city power
Implementation close submitted of course daily tenders note assessment peer and self class assessment discussed note provide services trade skill report phase1,2,3,4,5,6 registered trade

test reading experimental close Portfolio evidence documents week lee attendance release resultant statement

5.-2.1module: induction safety hand tools Conductor recall carry section join crimping soldering prepared fault find control contactor...

Adhered to correct instrument is used fault find the control panel... distribution fuse AC heavy current motor control open circuit. Short under voltage retain fault single fault application start motor db system .fluorescence installation switch.

Following controller main circuit phase squirrel cage induction motor can. Director line ward automatic start delta autotransformer constant torque phase rotation...generator AC machine transmission... commission capacitor starter phase slips according.

5.2.2. Code: recall application section of the training act 56, 1981, Gazette questionnaire exam conductor method

Crimping joiner electrical mechanical.

No dry joint a damage allocation. Specification insulator testing instruments cables make off core PVC armored MMM core high voltage gland ferrules and used to accord joint rating termination...sibs 0142 identify ply cable 100%,test gears circuit machine protection.

5.2.3 Objectivity: relevant color marking and correct use sibs 0140 hand tools identify checking forming character gas weld working piece trade correct according tender number

Chain block ton max shake ton sign work select voltmeter ammeter energy meter select safety Identify electronics compose wire wound up to metal oxide capacitor ceramics diode transistor thruster %100 correct Solder

2.4 criteria recall the operation of different type of battery identify various type correct maintain according. Manufacture electrical system f connection applicable auto electrical... fault find auto electrical all safety aspects adhered to. Correct according manufacture check and adjust correct procedure settings manufacture camber and...

Correct process adhered. Teat correct stable multivabrator use dual wave form DC AC average value peak frequency rams frequency all reading be programmed p.l.c

..6.1.3. Company requirements

Specifically theoretical pass requirements mathematic and trade theory subject employer college apprentice relevant subject n1,n,2,n,3,n4,n,5,n,6 n diplomat saga award n body quality insurance assessment. Trade test and council engineering.

Applicable value point relate years experience , certificate trade ,5%cleare time frame project, plan training clear roles response, equipment workshop, including.restrsint

6.2. Engineering n diplomat duet career and engineering n diplomat saga qualifications criteria time table n1, n6 trade engineering subject career mentoring outcome subject engineering electrical electricity .college implementation n subject... mathematique,engineering science , engineering drawings.trDe theory electrical,electrotechnolgy,power machine, engineering physics, chemical engineering department.outcom industrial electronic trE test theory.logic control practice learner level infrastructure construction electrique..Outcome engineering electrical career generation, transmission electromGnetic level continue.isat integration practice engineering lab workshop experimental...time frame framework. Practice theory integrate assessment employment saga qualifications Engineering n electrical criteria instituts,sasseta.employment compagny trade gov career graduate internship close city power careers.eskom career training career graduate saqa. engineering n electrique field panel wiring electric . drawing electrique,control logic .cable join .fridge.substation .generation motor .work 24month qualifications.categogie career mining gov and labour examination expiremental, guide ..

.city power network metering and partnership Eskom generated transmission with appliance need. Consolidated for students have time table to visiting reading...security system information access studies or traffic police in building city power, regulation with student accreditation seta sasseta assessment police or circular to working database system entry visited in and outcom student visited day week . Attendance for reason study in trailing BT's city power card passport visa tourism negotiate career graduate student. Visited is individual self assessment student career. And class group school assessment coming for extra visited or large attendance... Access control ticket for interview career asks or donate individual research things student knowledge individual...

.7.Labour health education for engineering in plant...labour mining examination student examination safety to prevention hazard or any dangerous incidence student labour give permission for engineering to visited plant. Coed if for insurance when is problem to health machinery. In compliance electrique for trade labor national diploma they are covered by inspection labor

7 .14.1Mining qualifications categories maw give permission to visiting categories foreman tradman electricity mining industry. Hazard exploinsion fault discrimination detection exposition mining plant solutions permitted for trade mining they are covering visited .power mining coil copper etc

7. 14.1 Dti industrial trade gives that permission
Department education and go department. Any proliferation for trade.
Development infrastructure for student's .city power cable trade in appliances
Coverage human resource city power can be claim to data labor department mining department for student visited extra time work over time on training city power space municipality...power explosion...government....steam mining geotechnical investigation earth discovery in natural they are covered insurance student visited places and personal trainer learner working visited electrique engineering.. Technologies science innovation.
8. 19. Purpose design integration. City power. Study information on line career.
Home customer, tender city power career.
19.1 applications for electrical services responsibility for providing electrique service to property owners in the city power. Billing service division two categories namely small power uses sup and large power use plug electrical services connection no greater than56kva in general type of connection.
-Apply to convert a sup form post paid to prepaid Billy
Apply for new prepared or postpaid dupe connection.
-apply for a new connection.
Region revenue...
9. 19.2.. feedback.guyser control, meter reading.schedul.tarrif info, prepaid vending, energy type, fault Loggins,load shedding, library, claim,tarrif info, tariff library , monthly meter ,meter reading,
19.3 meter estimated...
Company secretary m smith. Executive director,
.. Registration number 2000/3005vat numbers
Insurance claims form electrify account number, prepaid meter street,code,postal address, city power number, call centre , description of how the loss damage, occurred insurance repaired replacement quotation .
-leadership seniors management team, compagny.media.

-theory city invention metering city old metering power.daig business with city power,
Supplier vendor providing services,
- company awad.compagny registration, originally tax pine, relevant,I'd,direct,B-BBEE,tender.
10. -20.Hearing conservation programme.
Training awareness and induction programme attanded.noise exposed registered audiometry.during induction.
_content ..loss, regulation city power
-trainong shall cover,
Content and scope training of the ihl regulariion records
.10.-21. request for quotation
Name date post, closing,tender, description, additional, business plan, quarterly report,AGM,red year report, annual financial statements, service level agreement, staring period, endings period.
22..Application for electrique supplies stand number, township, building name, street address type use, residential, commercial, industrial,
Customer account.customer meter tick
-New service connection.
New service connection, single 80A.tree phase 80A, prepaid convention.other...
- Convention single phase 80A, smart metering, repositioning of metering single 80A,
-up grade download of supplies existing am requesting.new meter box boundary existing cabling.
- city power agreement supply of electrique applied for is govment by low application liability according, routine monthly read, notification, connection, connection objectivity, registration,name domestic customer service connection not exceed 56kvA3phase ,80Am to supplies R1200, outcome. Customer log fault
Measure the power of learning and criterion are registered trade mark of education testing services. prepare for criteria asservissemnt test exam skill. Discover practice full. Employment testing services are design engineering aptitude minute test design, criteria
Type, test measure trade mark holder. License electrician assessment, apprentiship.license electrician theory and license practice. Wiring meter box sub and switch boor, men system, comment licensed, week basic licensed including readings comprehensive test numerical reasoning test
Trade apprentiship.problem reasoning perspective math.mechanical.electrical.physic.
Questionnaire company qualifications question theory electrique test power current.
24. Fault find and protective. Control circuit...

-Installer rules: PVC flexible conduit isolating switch correct factor Sep
Cable burette, depth cable, cable installer.

11. 22: metering error connecting prepaid, over load, no power accident on appliance power metering consumer procedure claim fraud crime metering
Logged call, off metering minutes,
City power and Eskom on line metering recharge prepaid:
Compared metering old analogue indicator kWh day daily check by service accountability kWh building account energy meter take 1day20kwh room house estimate ×360days7200kwh years energy heater consumer indicator safety key lock metering analogies reading value 7200kwh, to rand cost Bill discount prepaid cash metering return back tax vat customer consumer building large medium tax redistributed 3200kwh real amount prepaid on metering digital. Customer's pays money 10rand have 3kwh to 5kwh, consumer readers
.. electric wiring factor building installation electric and appliance design supply need real time cycle for that discounts technology cable police respire main tenant old cabling equipment years 10yrars replace cable high voltage transformer to cleaner reactance synchronous machine on designing reader's kWh 7200khw coverage policy main tenant check point kWh lighting was default fault appliance claim and fault old system design by networks system city power in interconnected news building and account nest number industrial news technology need to claim visited plant,,tpm engineering design AC DC current step task creation operational curent assessment
24. Purpose comparing estimate:
Designing and investigation: electrical power transmission network: protected and controlled high voltage circuit breaker inside electrical grid substation relays scheme can be complex.
-oil minimum circuit.
-overloading excessive, curent not due to faults,
-short circuit fault between phases, short circuit,
24.1 classifications
- Oil circuit breaker OCBS, vacuums circuit,
-SF6 circuit breakers
-air circuit breakers,
Oil tanks in oil circuit breakers or normally, oil is very good insulator has high dielectric electrique strength, cold oil is able to act as on insulator,

C... design
Good quality as below,
Good heat transfer Quantity
Short arcing time
Comportment
-high voltage used service, on circuit rating 600v, standard 4,160to 765,00v and 3 phase interrupting 50.000to50, 000,000kv,
Electronic symbol circuit breaker...
Transfo MVA, found in substation 600MVA, 3, 6 35 kV industries,
-switch disconnection. Use control section switchgears panel...
_Construction...bulk oilcinductor bushing, fixed contact, moving contact operating,

Vic vacuum circuit breaker.
Oil circuit breaker less risk,
SF6 current breaker very less,
- Mechanism operational, insulator, arc contact, frame lane contact, hand operator, electric solenoid, frame, Erie tropical,
SF6, high sulfured fluorite, is air interrupted...

12. 29. Conceptual problem conception assures efficiency conversion of solar, steamer thermal hydroelectric renewable energy electricity lower acceleration rest...
Integrated concept light draw power consumption.heatet calculi power dissipation operating bulb time costrb, cost appliance electric fusible.
-Rating fusible high voltage relays protection advance:
Z, impedance cable breaker tranfo, conductance fault detect

12..Generation resource .network transmission system
Time table engineering science .physic engineering chemical, electrical engineering. Mathematics engineering, apply to the career outcomes skill to make a agreement arrange power city training visited engineering estimate resource internal and compare additional system explain reasoning engineering in point
24. Mechanical designer process equipment, area removal. Physic engineering .area...A1= reinforcement area jacket steam

.

Descripton unite	Yes not
Designing plant and economic chemical engineering and physic Engineering limited for corresponding limited years analogies computer. Specifically internal energy u to system robe do/St rate kinematics rate input to system (U1+g1+1/2v) dm1/dot... (U2+gz2+1/2.V saque).DM square/DT (rate of energy input)-(rate of energy out)=rate enegie chemical plant large quantities heat 150 degree Celsius ,1000kwh shaft delivery steam turbine power... 10 bar /400 degree Celsius..generator 1500v.. Diffuser,super heater .. dQ/dt-dw/DT=F square (H2+g.z/g1+1/2.vsuare)-f(H1+9z/g+1/2vv2.v1 square./g) Initial interest rate percentage n program computer print out following in job map ..voltage.. Emergency system energy .compare Electrogene group motoring test compare fuel supply direct bore store 98,5/1040,,cubical capacity 3200cm square, compression ratio 17,oto1, valve gear d-0-ho valve. Engine output max power peak150 kW,118,power peak redli e 3800/440°,mac torque n.mm343, torque peak..test Applied thermal engineering fuel tank Nth=hbh/htx100,,,swept volume. Vs=π/4 .Dsquare.L	Estimation system

100liter, pay load 756 .homologated, Warranty and service 3years kWh ..kmh rpm engine power 3800r/m power/mass(w/kg)61 Power/litre kW/h38,torque litre NM/l (P.V/T)n.t=(P1.v1/T1) working .volume of .head...low conservation transfoy in system Audit overall applied calculate efficiency work.donr.Ew=F.d. P=E/t....Ek=1/2.m.vsquare.Ep=m.gh.. E e=v.i.t. Eh=C.mΔ.t.,. efficiency ¶= energy out/Energies input....power output/power input..low	

13. 21. Engineering systems modelling N assessemnt for engineering police in St peace college was covert by lecture note and sylabus reading
Introduction topics lecture note.and policy overview St peace college orientation guide and visited city power policy training circular note key learner apprentiship work job career.

21.1 framework and tools : scientific assessment making model exhiy -framework science police . Engineering electrical innovation Portfolio evidence
Implementation in city power training complain claim police case study training recall resolve conflicts safety security in city power science analyze student case investigation.scenerio in city power .
-Framework precautions : student prevention safety trade machine circular time table training city power learner prevent precautions visited development work study conducted trade infrastructure
-Projection: precautions preparation frame study. Air polutioning science natural.
-Project checks point gate point assignment engineering electrical:
- Case studies: engineering electrical council engineering and trade council labor analyze in government city power framework regulatory legislation: mandatory legislation police power

and mandatory engineering power constitution go Gazette power attorney to work empower development learner

-model

14..22. engineering electrical: specifications of machinery equipment. Motor machine generation battery need to made verification

load cycle., duration electrique,time ,duty, continue operational ,periodic cycle consisting cycle of a time of operationel,load and time of operational at no load there is not time energetizer and recycling and reacting in cycle duration factor,100tn+ v load cycle.

Duration time electric lost electrique breakdown, on period operation load time inertia factor breakdown=power receive methods effective load applied to the motor thermal relay contactor _policy maintenance engineering remanufactured tom cleaning meeting do check action take activities equipment breakdown re valuation. System products city power breakdown energy metering guises break down .student breakdown exam weekend over load. Operation excessively.net operation .time net,

22. Engineering electrical planning organizing days shift task activities development system .day visited city power week.week.week.week. CVS

Step task check revision

Electrical engineering.ac DC machine engineering. Motor generation machine conduct move DC generator operator satisfactory a motor fundamental speed equation in put output,

-parallel circuit distribution engineering reactance resistance impedance suspectance reactance total admission power factor circuit problem. In the find

-Tc parallel AC generator balance magnitude heat, phases system: P√3.E.I cos phase power transmitted two receiver two single phase ,transfo secondaire A.load circuit source,If√4.l/c non oscillator transient.

AC ,time of the rms I/√3.Im..

Company Serie circuit power distribution total suspectance,admistance,theory

Engineering,zA,z,B,zc,,(a+jb),,,(c+JD),,(f+jg).. engineering capacitor operator angle free.

Development Serie resistance impedance equation compare loop linears ,sum junction

R1+R2+R3+.....series

1/R1+1/R2+1/R3+...parallel .z1+Z2+Z3+...1/z1+1/Z2+,1/Z3.../G1+G2G3+..1/G1+1/G2+1/G3..../gradient vectors

Developing Ra+RB+Rc+=Rsh

V(RB+RC)=v(Ra+Rm..

RB+RC)(12-Im)=I'm(Ra+RM)R(Ra+RC).

=I'm(Ra+RB+RC+R)=I'm(Rsh+RM).

Descrition	Total unite
Engineering,zA,z,B,zc,,(a+jb),,,(c+JD),,(f+jg).. engineering capacitor operator angle free. Development Serie resistance impedance equation compare loop linears ,sum junction R1+R2+R3+.....series 1/R1+1/R2+1/R3+...parallel .z1+Z2+Z3+...1/z1+1/Z2+,1/Z3.../G1+G2G3+..1/G1+1/G2+1/G3 ..../gradient vectors Developing Ra+RB+Rc+=Rsh V(RB+RC)=v(Ra+Rm.. RB+RC)(12-Im)=I'm(Ra+RM)R(Ra+RC). =I'm(Ra+RB+RC+R)=I'm(Rsh+RM).	

PMMC..is essentially a low level DC , parallel instrument..VM=Im.IR...

-Engineering transfor system.comparing power distribution assignment watt output average output current wave line secondary statement a(c). Delta, delta start. Start delta start star. Zigzag delta zigzag star anaphase...auto tranfor .courent voltage transfo high voltage. Equation load circulating switch transfo.balance load application of.postef

Electric technologies

14. 28. Compare training assessment and assignment engineering electrical to implement time table workplace workshop academic in trade social city power design factor training

15. 28.1 requirements: subject and module:

-supervision in industry

- Industrial orientation

-industrial organization trade theory electrical, electro technique mechanitechnique language compulsories a, language business saga NVC level national...

_anted :for subject engineering:

Anted care educate training facilitator, and learners port

Practically college academic: philosophies practical school guideline employment learner

-28.2 what are didactique strategic investigate multidisciplinary. In development goal construct training materials and evaluation, how the model is didactic expertise as aspects education didactic of instruction and facts authority and telling authority written.: implementation circular St peace college didactic material framework regulator tools assessment for learner and trainer system information, file material metering to material didactic city power and Eskom material training education support .method measure instrument of evaluation. Visited p999ortal career scope assignment goal value cable population city electrification attendance is available. For employment

29. Methodologie .more

-Orientation guidance school ,organization lessons ,compares organization supervisor industrial in St Peace collie regulation City power training:

-Lesson plan grade .and class engineering technical Grade 12to 9,, engineering nated classn1,n6,. Level 1,4 ,

Lesson plan technologie

-education technology matric and trade Engineering app video course ressours.

-projection orthographic.. orthopadagogic , orthographic isometric

Orthographic drawing,

-activity , subject area orthographic projection is a technique used spatial vision three dimensional object,can be convent,

-Lesson plan it association of training plan : projection city power light metering ,gysez planing and subject module required trade theory electrical module .wire premise power factor consumer plan.inatruction didactic form city power assignment:

-Orthopedagogy pedagogic

Module week:

Daily 5: planing and preparing lesson to include

-view lesson planning is critical activity for prepare Childress

High phase Templars described.

Key component : city power care training practice.

Explanation overhead or projector used keep.

-lesson plan: is a document that outlines the contents that your less step-by-step student teacher

Lesson plan is usually prepare in advance either cover one off , activity,entire lesson ,

Lesson St peace college unity in trade training

Day visited week visited.primary include activities

-lesson plan: board city power metering days care visited St Peace college module subject integrate Portfolio assessment

Activities.

Objective lessons goal feedback science lessons anything from, experimental to monitoring or to diagramed

Lesson plan run smoothly.

-provide reflection: in the lesson greater way.. Lesson metering system city power goal megawatt and city appliance compare lesson module plan at peace grater.

Break project down .module time table visited plant operations and break.sectiin checklist,

Learn number life student complex, activities all orthographic drawing quickly grade level (9-12).

Required 45 minutes subject area geometry problem solving share bottom shaped 3D objects copyright engineering are connected, activity view isometric,

Pre assessor drawing challenge..

Circular police assessment.

-management system information:

In St peace college and integrity police system saps and city power , technician indicator persal personal police employment system data base.polfin police financiaire statement, training goal product humain resource and

Indicator number titles

-indicator building management implementation

Indicator criminals dismental lab ,

Career secret purpose involvement laboratories indicator laboratory indicator training incident system support evidence report directors t implementation.... city power indicator trading lab record keeping finger print training student and St peace subject record clearence visited day working to report crime togheter,,,,method research crime evaluation in time table script transcript component fraudulent module appliance in city power and report over load required.

_29. Teacher vocational: guidence counseling interview verbal communication career design in training city power and St Peace colege learn more career outcom engineering electric subject nated exhibition engineering generation transmission power station.electrician engineering to city power engineering career

Questionaire design what is leading to pursue a career counseling have excellent written and verbal communication skills approach counseling assistance stator management attorney audiology ..what are the communication skills communication,wath guidance counseling characteristics off effective guideline counseling interview School may be focused on graduation and , career, balance career teaching that employee look for candidate, including college professional,

Caracteristique Component Company engineering electrical: design generation transmission in training power metering design caracteristique level

. Stability. And with the principal key power: load over load rating , switch,

Company..

15. -29 required management trainee class and company training

How to management and control during teaching

-how to organize teacher filing cabinet training room trainer room libraries visit to .

How to organize a lesson plan . Trading

Material , library training and report form city power organization, implementation trainings and St Peace college textbook reader module trainee

Description management and control a class during your teaching filing system form city power Eskom, compliance form issue filing day week evaluation and certified lemons instructions metering

Assessment functions

15..22.Requirement: implementation and stabilization to training visited trainee engineer, education..Anted examination training and labor inspection work inspection police inspection school ,compare industrial city power go inspection

-general inspection category: and training schedule,

Carrier training adducting modified I is additional training practical applications,

-cycle of training application auditing , visited plant operations

,Step may take long or short time completed all operator must develop the ability to detect the ability detection abnormalities positive result achieve by student visited places working training system main tenant power city equipment in good condition and St peace good performance examination time table assessment,

-autonomous inspection step 1,3 tentative inspection standards compared reevaluated to eliminate, detection and treatment of abnormal condition,

Minor servicing of machines ,molds, gigs and tools .

_29.1Organisationtidness, autonomous maintenance.

Focused and elements:

- Operators responsibility organizing stand for operator responsibilities adhere to recording.kwh

-focus work and element promote organization and eagerly operation visual control work in control process product kWh / reader.

-measuring instrument and foil proof device, element inventory measure instrument proof device and make sure they functions properly inspection and correct deteriorate kWh metering city power training is work ,

-focus equipment precisions ,operators must check precisions of equipment kWh metering geyser is précis instrument,

-operation and treatment of abnormality,

16.Requireded hearted meter energy breaking component

.destruction.

Conductor.insulation.maneticfield .

kWh/ ..joule input copper wire..component heater Peltier .break.explosion system, limited stability load . circuit breaker load heater Peltier thermocontrol....metering limited breaking , Air cooling system breaking linear systems circuit wire cold.component cold ,,220v .6,6kv..Peltier heater load 220+20volt Peltier 240volt reactance heater system..

Operationel,
wrote:
34. Required: labour training quality body assessment,driven machinery regularite safety 1993,acting in term code practice., director.
17. _ content training city power and St peace practice assessment.quality body insured,duty authority and duty acreditation.saqa and sasseta institut sets mseta seta labour skill development field of activities.
- training system record detention,time table subject learning reading
Lifting machinery .and machinery manufacturing management.
-codr description.
Counter balance lift true ,rated capacity of 3000kg reach lift truck..covoyer logistics lighting ...order .
Machine code compagny capacity .
Pre start check detection ,
Pre operationel test in control,total item uncheck theory ,penalties ,UN heked,Pre assessment X2= maximum,
Total Pre star and operationel, practical x time penalite item not specific ,penalite,body stack,fail stack correct position for travel close remove close down total operationel,time .insurance logistics.transpirt Riggin material construction supply...

Drawings explanation: building compare St peace college knowledge design analysis investigation.aystem engineering and trade theory
Designing system engineering electrical drawings,mechanical drawings, building drawing . orthopedagie . lesson.orthopedagogie.system module activity.. reproduction analyse design.

18. 32. Required operationel Appliance customer to city power and more St peace college time table reception and attandance assessment engineering,
direct energy conversion system. The direct PDC MHD conversion system s.
Plasma dynamic conversion system is a method of conversion system is a method of converting thermal energy plasma in to electric power without magnetho thermic .display energy bulb electro tube basic electrical energy government watt solar she produce 03to0,4 kilowatt,
- insure generated energy
Lab segment development. Power of about 93kw, government RSA provide 50 watts solar home system rural bee20-30%renewablrs variation analyze method, input data,
Input scenario energy demand yes supply option yes ,use interface ,mesa database, reference energy ,tech coda parameters,messa gematrix , emission, new installation, result storage data ,option for supply electricity rural homes area 0,4 to 0,5
- Department of energy found total uncle trifurcate house rural unelectrifier,
Total population 0, 31x061=<5298 millionxo, 32x0, 62=1000, projection house hold bee

19. 33. Thermoelectric effect..generation product natural appliance vs metering effect energy. Dc. Vs PWM supply type recommdation manufacture comparison of two technical control lin 25k ears vs system .
I/max when dt <25 .
I max should there 0,33, I/max ,dt >, I/ IMAX should ,0,33-0,66 IMAX coefficient of performance,CoP=QC/pel
Performance vs current,
Thermal controller heating,
Linear vs SMP tech controller 12.A up to 2x16A.,
-33.1.Design process:
-Estimated heater loard system appliance and power total
_define temperature.appliance and metering power system
-choosing a Peltier elements.
- heat sink
- calculate
- temperature sensors
-powe suply requirements
- Thermo electrical cool

& Design a complete system estimate appliance guyser ,fridge and steamer system

-Thermo electrical material build .

Operationel principle, construction desig

material,

Designing

-identification guyser stwMerter

-caracteristic,metery

Ie

Benefits: function heater exchange, uses consumer production industrial , science.

-object yes , metal plate yrs, Peltier yes Q,heater sink yes Q.rth ambiance,

Estimation load dynamic,dQ/St. Load QC transfer THS heat Tamb+ΔTSH

[K].dt=THS -To=Tamb+ΔTHS-T0

-COp=QC/pel..Max.min Pelton

dI..IMAX=68k,lmax=5A,Vmax=1,5A, current and voltage,I=IMAX (IMAX)=5Ax0,45=2,25,

V= pel/I = 16,7w/3,83{7,42

Heater sink elements we need knowledge, required heater rejected vs current

Qh/max=max=0,6..

Qh=Qmaxx0,61=41,. ..

, Operationel

34.requirement metering

Logic system Min Ter max term .

Control logic loop

Analyse function asservissemnt,radiotech radiostasie.

35requirement operationel , information management system,, communication skill admi

telecommunication computer ATM air time metering design transmission data system policy

Control source traffic function Arriva

-Policy map input voice class voice not gateway interface ethernet,

Service police input research priority yes,

-ip on existing

-inputline wath

-policy output data ATM .

Class default date, use ,attack ,account,queen, delivery,dial session, description, switch port access, describe rout age, passerel.police regulatory communication metering appliance vs metering city power communication data systems ATM process framework regulatority.over load transmission.dischage bill delivery, plan number control , government implementation gov taxation government ..

Police detective microcontrol VDC, Di/DT, fault..

-- 33.2Required.analyse circuit system lineare limited Saturation vinput v output.permenent network input output meseare, Qmax,e(t)=u(t).s(t)

System lineare relay delay position circuit analyse metering heater guszer .

System aervomecanism position.plc

Mean...e(t)=e(t)-r(t)=

Input output ..

E(t)=E.sin.to

S(t)=S.sin (Wt+f)

DC system transformer tension speed

e(t)=v(t).s(t)=t.wt..command v(t)..

Equation different linearity metering input system output system appliance ..

St (St).v(t).A.(t)=w+w..

Database data send kWh rather system send kWh ether reception transmission telecommunication..policy relay delay discount value 10@r,2,5kwh ..input 10kwh 10rand buy system 8 rand transformation system asservissemnt.retard line power cash time arrival policy network.. system gov,

Metallic layer fabric oxyde metallic alluminuim material R=¶.l/w...

PCO=vcoxl....Vco (iMax/2)...n (po/p1)x1000;;; vccmax -vcc/vcc

Requireded : engineering science physic chemical.. electrical..power machine

:

Construction architecture design file development.system input unity, control memorandum ram Ron outputs CTR display print,

- data cou,ram ,rim,I/o,. 8 bit but memory system.logic diagram ..

Engineering potential coefficient result and reducing voltage integration buy factor 3/5.initiL x = chart capacity .evoltage voltage solving different equation, 5 DX/St+3x/5.equarion incase voltage DX/DT=3x/5.reauired output integration, full scale voltage 5 bit d/a covert 0,2 volt digital in analogy 1111 ,SB = 0,2:full scale output =31×0,2=0,2 A event bit D/A delivery an output current, 100mA,let B=10/20=0,5 mA ,,1110=29×0,5=14,5

Analogue computer camparebdigital computer ..

Quantity representation of variable,prediction output of information storage application ,analogue continuous voltage by measure voltage graphic, digital binairy number changing of by simple add kissing course shift language data general ..wireless communication .

Metering and supplies electronics .

Re

R=¶l/a...π. d.....s=2π/d... screw..join cable make conductor...gauge...cable
Density.volume.. d section across voltage mass cable kg , volume cubical cable cm square , area surface , meter cubical. Copper.aluminium.zinc.plomb.
Oil .water ..
Join cordon cable ferulure.mass join step make conductor .
Skin effect ,Courson effect,joule effect
Resistance to power current. energy..
P=R.I. T....

-test cabling material stress test eprouvet MPa cabling effect

deformation elastic plastic .PVC polymers polyvil caotchouc .insulation papper material insulated cable join .plastic 220 volt
Plastic.ceramic insulation high voltage glass 1500kv

F= Qa.qb/r... €....
Cable
Mechanical resistance alumelec..maichor ..transformer join
Conduct hearth

Deielctric.isulator charge discharge cable .high voltage discharge short circuit..
Magnetic material.,field electromagnetic
Insulation conductor magnetic hysterisis ferromagnetic, H..b.i.u.,.
Coil making ..

Number support kV..number substation.

On Fri, 14 Apr 2023, 17:58 TSHINGOMBEKB TSHITADI, <tshingombekb@gmail.com> wrote:
19.. 47.1.Requireded: operationel subject field saqa . seta implementation
Saqa award certificate.
Assessment conduct seta
Saqa award diploma certificate n engineering.and
St peace college training skill.mseta CHIETA.. development panel and control wiring
Level engineering electrical.infracture development. Meeting saqa requireded I'd..no meeting statement skill development.id certificate award St peace college .db box outlet socket switch dol motor.transformer.
Control instrument mechatronics,
Career development city power graduat.implentation .career
Continue trade skill supplementary trade meeting month trade . foreman

ID: 258968 saqa commissioning domestic or commercial .
ID: 10259 saqa fault find repair and maintenance tree phase , electrical engineering.
ID : 263006 saqa ,demonstrating wiring of premise defining
ID : 258937 ,install ,maintain low voltage,DB protection
ID116466: inspection and circuit ,
ID: inspection and maintenance control and control panel and circuit ,
ID111388 :saqa electrical engineering and construction
saqa I'd 67461: N3 code instruction category meeting ,A,B,C,..
Level2,3 ID : 258937..plant generation , distribution, construction mining chemical and energy sector, maintenant,DB, protection,electrical safety cleaning,
--scope of work specifications.sans 10142,
- circuit breaker ,isolator, contractor and relay ,install Db , inspection Db ,
ID10607, 10605,10634,
- replace fault
-ID 116434: control electric network from a control electrical . Centre sgb ,power plant .field manufacture engineering and manufacture.
-Switch way panel wiring education technology.
I'd ,electromechanic .electrotechnique .. teacher I'd .saqa .

-47.2.requirement n diplomat engineering.
ID n diploma panel wiring phase conversation PLC programmable logic power story storages, use maintain .graphic diagram design, St peace college outcome career generation power station and
saqa award degree diplomat continue supplementary assessment student subject choose trascrip record no meeting engineering electrical diplomat dhet . Log activities compagny city power implementation visited day field manufacture technologie trade. Training

- interpretation drawing electric code graphic.
Purpose. Assessment : explanatory electrical plan create electrical plant ,
Content ,wath is purpose benefit of electrical , metering city power and St peace college workshop
- how to draf an electrical.
- tip for making electrical plan , interconnection of different component and fixture to the system .in training cooperation.visited
- power line with details such as size voltage ,rating , power transformer and winding ,the main switch breaker and fused switch,
- draft ,step layout scale drawing room ,cabinet ,step 2,plan it advance your electrical plan, step walk your pla building.,tips for making electrical furniture light switches and electrical outlet,
- plan for additional outlets renovation,Amount table Lampe,yea,later ,appliance wiring plan,
-electrical plan legend
Celling mounted light ,duplex receptacle,telephone outlet switch.
- basic electrical plans ,
- patients room electrical plan create your electric planfirm a patient ,
Basement wiring plan
--when listings out item such a feeder breakers and wire size,for particular project piece of distribution equipment ,
Intern of electrical distribution,
-schedukes are often included switch board and panel board, drawing to list number of circuit breaker load feeder ,size and number of wire ,
Project
Schedule usually expressed in tabuled,organised self explanation.
-typical ref, legend and
- build drawing s:
Construction project is completed is revised drawing,created and submitted,constructor ,high,any charge
i-nitial design drawings .
-Construction process completed .
.

-Electrical drawing and schematic.
-designing installing troubleshooting electrical system requirements use variouse ,line represented.
- design engineering and technician use schematics to build and troubleshooting
-one line diagram: medium voltage switcgear one line diagrame , and power systems single diagram.
Is often drawing flow of electric.
Typical: major components in the power systems list system voltage , transformation impedance , interrupting rating and fault current just the basic .item
-Drawing should be kept .
- main control room of a
-switching operation buy identifying feeders and the load they serve,
- system voltage frequency phase and normal operating position line diagram,
- for more detailed view of an electrical distribution system,three line diagram is used phase polyphase A c , system drawings, connection.
- diagrame show distribution component such bus rise ,bus plug ,panel,board , transformer ,small ,branch circuit, drawing alarm, system,

-schematic diagram
Purpose: man schematic diagram emphasis circuit elements function relate components, series or parallel
Found ,inductor ,diode ,logic gate, fuses contact ,switch ,every circuit,

-circuit breaker control schematic:
 wiring diagram.terminal for selection terminal ,relay ,load detector relay wiring diagram .
-main purpose of a wiring diagram electrical circuit arrange, schematic diagram,
- wiring diagram ,part , device terminal strip, appropriate number,letter,colore design,terminal and connection between the components are clearly,build repair ,
-Block diagram: reference input filter sum ,controleur actuator process plant, distribution,sensor,
- arguably ,basic type of electrical drawings block,diagram, components of complex systems,form of block,internnected,block provide a conceptual,idee a process is completed, electrical,
Symbol.
Represent schema
-logic Diagram: current gate and logic gate clock
- breaker faillure relay logic diagram .
Modern protective relays utilisation diagram to represent complex circuit process .electrical.
- schedules.

A buid
Electronics use soldering.and desoldering . system..welding iron ,solder ,silver,or copper lead , desoldering,plug ,outlet ,cleaning disconnectorb,connector.printer circuit fabric film microship process. Silicon.plastic molding..
Fit recess .fit wiring .process..
Control
- instrument method selector design metering process

Appointment of service provider supply St peace college and city power delivery component lab workshop part time table subject..
-introduction golbak stage St peace college .
-Scopes of project: projection requireded supplies to purchase and deliver total ,.
-Special condition component
Subject module metering
4.purpise documents.
Budgets: a projection budgets St peace college city power time table fee.burasary.close graduation internership fund student.gov
-Quotation value tax (vat) project :
_time frame project is to commence success bidder
Firm price subject , name of the compagny quotation close
Appliance and compagny subject.
- item description of good part number quantity
Evaluation criterion (80/20).
-request for quotation number
-limitation to quote supply and delivery
Item/ description of good //quarit///price/// bid price RSA
001 /engineering electrical practice workshop projectye engineering open view lab test lab and workshop practical saqa .dhet training exam papper .seta . asssessment
police //// amount estimation fee
Total include .8modul x 24subject x3month 200 projection years aman's test experimental technology.training integrity one project ..
-deliveri period
Specifications requireded for project:

Item,

part numbe
r, performance b,
size,model
Inlet .
Outlet .2.12

-
:
T=1/lamb.ln 2...
Unity design

- : Metallic layer fabric oxyde metallic alluminuim material R=¶.l/w... PCO=vcoxl....Vco (iMax/2)...n (po/p1)x1000;;; vccmax -vcc/vcc Requireded : engineering science physic chemical.. electrical..power machine E=T1-T2/T1=100%. , VP/P=VRT/m=v..sq Efficiency=w/Q=1-T2/T1×100% P1.V2/T2=P2.V2/T2 W=W=P1.V1.lnV2/v2.. SF=4,187lntf/273.. T2/T1=(P/P1) exp r-1/r W=P1.V1-P2.V2/r-1. PV=M1.R.T Q1=m1.C.ΔT Q=m.l.v U=m.C.V(T2-T1).. (V2/V1) exp r-1=T1/T2,	

¥=CP/CV.., R=cp-cv W=m.R.t.ln (P1/P2) P1.V1. exp r=P2.V2.v2 r W= m.R.ln V1/v2.(T2-T2) f exp 1= fv/V-v f exp 3=f(v+v)/v V=\.f f= C/2.l V=√¶p/p=√¶.R.T/m V=√F/u V2/¥1.=V2/¥2. f=f(v+Vo/v+vz) f=1/2l.√p/m E=F/Q1=Q/4.π.e dr.. Electricity. W=Q.V.....E=m.g/q.....Ek=w=vq Q=C.V.....E=h.f.....F=q.E.....E=1/2.C.v exp.....V= m.gr/Q.....t=R.c.....S=w/F.....r=Q,/4.π>£or V=k.Q/r...C = €r.€o.A/d.....F=k.q1.q2/r sq Ek=Q.v.....e= v/d.....1/c=1/C1+1/c2.....v=|.f W=1/2.Q.v.....m=EQ=(V/r).Q....C=k.€.oA/d.....q=F/m=EQ/m=vq/SM..... W=vq=1/2.m.v sq....@= Q/4.π.r.....w=2/2.c.v.sq T=1/lamb.ln 2...	

:
Construction architecture design file development.system input unity, control memorandum ram Ron outputs CTR display print,
- data cou,ram ,rim,I/o,. 8 bit but memory system.logic diagram ..
Engineering potential coefficient result and reducing voltage integration buy factor 3/5.initiL x = chart capacity .evoltage voltage solving different equation, 5 DX/St+3x/5.equarion incase voltage DX/DT=3x/5.reauired output integration, full scale voltage 5 bit d/a covert 0,2 volt digital in analogy 1111 ,SB = 0,2:full scale output =31×0,2=0,2 A event bit D/A delivery an output current, 100mA,let B=10/20=0,5 mA ,,1110=29×0,5=14,5
Analogue computer camparebdigital computer ..

Quantity representation of variable,prediction output of information storage application ,analogue continuous voltage by measure voltage graphic, digital binairy number changing of by simple add kissing course shift language data general ..wireless communication .
Metering and supplies electronics .
Re
:
40.8..Requireded: award degree diploma
saqa qualifications I'd : asssessment no meeting requireded.transcript completed supplementary subject : foreigners transcript.saqa qualifications I'd :71638.
Higher qualifications.
Primary registration status,saqa decision number, saqa 091/21.
Registration saqa assessor conduct certificate .
Saqa I'd instituts foreign.no meeting instituts accreditation saqa decission.
Admni /30-39 NC's.
Total credit .
-assessment policy IE099-IE00.regular internal,
Saqa decission 10105/14 advance diploma intermediary phase teacher.conduct...
.n1-n3 national certificate engineering studies.
-N1: Saqa ID6710, N2 saqa ID 637375,N2 saqa ID 67491..Entrance...
I'd saqa award diploma N ...
Ncv assessment plan isat .
40.7.1.Subject.. assessment task test assignment internal external assignment .assessment tool.
Marking memo rebruc ,,.. topics subject outcom. Topic 1,2,. ,time and marks allocation 1h

marks...examination training training formal. ...training exam rwiten permit and time table practice exam days.
Fundamental subject ..icass .time frame, asservissemnt activities, scope assessment term 3, suggestions allocation .analyse grode..
Isat integrity practice..time frame .allocation require ..

41.1..required city power vacancies
Estimated ICT service
Research inovation:
-table of content .
Graduate internship
Training center employee.visitor student apprentiship visited education technology high school and trade development school skill training .trade education career outcom exhibition engineering education training.
1.city power vacance 2023.for officer special and variations use career opportunities.
Training oppoy . metering guyser . light city .training engineering career.
1.1 How to apply for city power vacances 2023.. student career granted.
-meter reading submission: St peace college time table engineering electrical Portofolio evidence low consumer panel wiring customer and plant experience design cost power factor demand reader implementation in city power loop .. interlock system.training partnership test . outcomes career student generation power station transmission trading .
- city power workplace ready to light up career artisan engineering.
- name of profile
- city power .
-manager vacance.
-city power officer vacancy.
-city power specialist..
-

:
40.10..requirement : implementation
--SAQA module award diplomat
-Award diploma n.engineering electrical
-Award instituts foreign decission saqa
-registration .award saqa n1,2,3,4,5,6.
-Award meet documents.

-Assement assessor saqa conduct moderator
I'd: 202001305040/20191130002
Dhet exam nated: 201000203812/2004007064381/2011007434332..

40.10.1 requireded of work experience logbook instructions programme code 5090840..national n diplomat.engineering studies electrical I'd :90674.engineering studies NQF level6, 360, credit saqa learner I'd 67043 national electrical engineering nqf .level6..learner name :tshingombe Tshitadi
,surname : Tshitadi Fiston.
Number employeer :
Details compagny St peace college city power:
Name signature...

Trade test technical environment
Date : ..... sign...

1.code.wA.0201
Purpose asssessment entry Scope.
Assignment question answer assessment evaluation qualifications St peace and city power metering

Interpret technical drawing: .evidence checking the drawing confirm relate equipment in accordance stand operationel procedure reading information written .
Design db box outlet socket .

2.undertake numerical undertaking numerical operationel geometry and calculation formulae Scope .
Terminate and connect electrical wiring
Date .
Signat
Material conformance checking and existence new installation site correct location.
Specifical
W0302 checking existing and new installation .making terminal,connection. .
Specifically .
Manufacture.adjust and fixing wiring support tagging and labelling cable,wiring ,conductor and connection .undertaking , specifications testing of wiring and conformation to specific .
Connection for conformence to specifications.use language .
- interpreting circuit,drawing .preparing work plans in accordance with legislation and regularite

requireded stand operator.using measures for installation testing electric wiring circuit .testing wiring enclosure and support system .indentification compliance relevant ,energising testing installation identify rectifying.completing report and documentation using short circuit comment relevant terminology,considerant plan Ning rescues or provision of assistance,isolating electrical hasard safety changes controller operationel parameter , Conditions air and refrigeration electrical special dues trade that lead diploma need experience ,
-Construction high voltage installation .
-substation ,
-pane wiring
Armature winding ,
-A. Running test function and recording fault and or equipment status indicated by buil in test function . equipment sub assembly, components connection and terminal ,
-removing replacing components and termination for confoi,isolating electronic , returning calibration electronic equipment sub assembly.recording ,obtening relevant circuit ,schematic manual ,isolating tagging ,and verified.refitting sub assembly ,
-specifie sub assembly,schema electronic recommissuoni g electronics equipment ensure,entering routine electronic ensure conformance,
-drawing reading drawing job . documents listed.maintenance .single phase.

-Repaired control loop system look evidence that confirm skill.obtain and interpreting engineering specifical technical information software hard .data diagrame historical to system components and operationel.
Consultant system other relevant plant personal with respect to control loop characteristics.
Confirming function malfunction of the system.
Component . checking operationel character controleur device,signal conversion instrument and final control element .
. identify fault the control loop for correct operationel .monitoring the response of the control system , using appropriate fault find diagnosis technicien and procedure throut technical.
Monitoring
Comparing collected data.operational.
-engineering . dismantling..service item setting appropriate test and calibration equipment w..control mode checking control ..install commissioner the control interpre data calculating control loop characteristics.install calibra.access and final control accessing data sheet.
Circuit.diagrame engineering.install sensor..identify cabling conductor .locating inspecting ..
Criteria

<u>Trade manufacture seta merseta sasseta accreditation .saqa assessment training</u>

<u>-Job instruction engineering electrical St peace colle and city power electrical wiring .statutory</u>

and regulatory.connection support..
Method material.test wiring for approval work
Learning technical outcome.self checking .,
-activity log sheet.state following equipment hand tools . Desoldering tool soldering fiting welding pencils

Activity :voltage power supply.long Bose portable electric hand drill.drille EXC.
Flat screwdriver used driving or fastening positive slottel scree.flat screwdriver is used in driving or fasteriing.join two support lead melted around,side cutter pliers used for cutting or terminal wired testing .soldering .join cable .chisel.resistance .ms program..
-hNd tools label program.criteria .score .identify.tool...
Terminating and connecting electrical wiring and electronic circuit.test termination . asservissemnt criteria.
Practice...

Dhet..faculty electrique engineering.
Completing diplomat logbook.application application

-Subject : electrique trade theory, industrial electronics, engineering science, mathematics, electrotechnique drawing engineering..
-Logbook cover page.: St peace college
Exam internal assessment and external
-application letter :diploma St peace college assessment circular irregularite final award saqa qualifications award diploma , certificate.vist city power training career inovation trainings
-Letter from your employer.career St peace college trade practices assessment engineering.policy practice school engineering.

-date period work specifically subject n6; qualifications irregularite..regularite assessment..
Portofolio evidence
Poe: asssessment policy evidence low

-Candidate work 18month St peace college time table trading practice asservissemnt criteria saqa.
Completed duty .
-Duty city power St peace career patrol
.
Certificate I'd
-Summary: academic info n4.n6..
Irregularite assessment police Poe's relate low .

Copy statement 12; subject n4.n6 ..
Subject condonation award.subject irregularite trade theory .. transcript academic time table.. maximum one,

2.relevant work experience .apply for diplomat, engineering electrical note adminwork experience in government departments ..qualify development social.energy . education department asssessor, instituts

Unity description	Yes /no
Regulation %= (220-210)x100/210.. Equivenlent transfo..E2=I2.Z2+V2.. E2-V2=I2.Z2... _estimal 20kva,2500,500v,single phase tfo.winding r1=8ohm .x1=17 ohm. Wining R2=0,3 ohm ,X2 =0,8.. primary voltage 2500 ,. O,6 solutions E1=2500v,R2=500v. Turn ration N=2500/500... Ration =E2/E1=600/2500=0,2.. apparent power s=20kva,. I= S/E =20kva/500=20×1000/500=40A.. - -refering to secondary side. Ro2=R2+k.square r1=0,3+(0,2) square×8=0,62 ohm Xo2=X2+k Square=0,7+(0,2) square x17=1,380 a) 0,8 lagging Volt.reg v=12 Ro2cos #+I2×0,2 sin @/E2.. Volt reg = 40×0,62×0,8+40×1,38×0,6/60 VR=52,96/500=0,10592,. % VR =10,59.. Secondary terminal voltage. V2=R(1-v2)	Estimation

V2=500(1-0,10592) V2=447,04.. 0,8 of leading. Voltage vR= I2 to square .cos@-I2 X2 sin @/ E2.. VR=40×0,62×0,8-40x1,38×0,6/500. VR=O,O2656..%VR=-2,656%,,, Point to key Secondary terminal voltage. V2=E2(I-vr) V2=500(1-0,02656)=513,28v. VR..VR=12Ro2 cos @+,I2Xo.sin@/E2. VR=40×0,62×1×40x1,38×o/500. VR=o,o496...VR=4,96% V2=E2(I-vr) V2=500(1-0,0496),,v2=475.2 volt..	

:

40.6 management multiple backroung task and interrupt driven system. Clusters system information connection
. Monitor display , basic knowledge suggestions reading embaded engineering electrical.
-basic circuit theory ,fund arrest ,how to configure pin microchip microprocessor
Hard basy trainer bird work station PC running windows Mavis Linus 13v DC motor power main gate gate mplabx cross compiled spreadsheet excell log entry visited internal external St peace college engineering access and city power access meeting agendas menute .
- project takeaway : how to read analogies voltage compare to implement a capture period measure fundamental digital,open loop and closed loop process control ,
_ fundamental concept unit introduce process control electromechanic I/0.

Process control: automate process control engineering deal architecture..
Automate process .signal yes control loop processing microprocessor computer fax signal yes, signal yes amp ,signal card , process yes ,tacho meter yrs , open control yes record count positive yes , ,,
40.7 maintence inspection: components program,
-inspectiins check operationel back ,
-inspectiins lighting inspection:bulb regulatority exam control ,transformer hardware and and gasket exterior light,
Electrical inspection: being simple carbon monoxide detector,as well as flashlight and testing equipment timers and photocell, should be inspected and exhaust fan,
HVAC inspection bfiltrrbdict filer

41.purpose. Study case ..St peace college energy rurale and city power energy.
4.1. Electrical grid system design to provide electricite way from it generation to the customer system ground from design kilometre and connection countless complex interconnect.
Workplace workshop practical projection ..lab system fundamental
Test problem requireded..
Eskom and city power ,
-generation electricity ,power plan warn to convert mechanical energy of turbine into energy use generator except solar power , photo voltaic cell ,power plan ,energy fuel. St peace college workplace.
Test lab experimental practical.
Result recording operationel:
kWh ..kV..day

- transmission :large high power line are crucial component .power plant pass through stepped up voltage voltage increase in electricite by transformer .by distance with typical maximum distance.

Result recording operationel test.
kWh .kV.ka day

Reasoning step up transformer are used is when long distance a conducting.long distance.loss energy problem acceptable level,

Estimation Pre test metering transmission grid extra high volt 265 to 275 kV AC , DC joint power station 600Mw, and power station 600-1700Mw,,hydro electric plant 200MW.. transformer industrial power plan and medium size power plan 1500 me..interlock 110kv and up . joint connection distribution grid transformer 150mw power station metering city power plant , 2mw industrial custome power station , solar farm ,eolien farm ,rural 400kw,50kv transfo

metring buildings house dispatch .

Estimation const inspection area building infrastructure.

Test lab open views stwich gears inspection fault .circuit breaker fusible ,Relais
Power system of electrical increase descrease note lab
Supply test month average costly
Methods use for switch control circuit during normal operation, permit to switch off on the generator ,transmission distribution equipment.
If faillure occured short circuit heavy current pass.feature switch .
Switch operate in order isolate health system b, discrimination,,switch air break switch medium,
- oil switch they operate in oil arc that occurred fuse joint ,anormal temperature.
Daily week time open ,time close date

- circuit breakers: switch can disconnect the circuit but it is done equipment which open close a circuit under all conditions like ,full a circuit fault condition ba circuit break can operate both manuelly can opere under high voltage type current .
Test day daily month ,

-relay: is basically a device or switch detect fault system then it provides the information to circuits breaker ,
- can operate to prevent the health .
Primary relay is connected
Relay trip circuit ,relay electromagnetic induction test ,
Type of switchigears,2 outdoor type,2 indoor type,66kv ..

Test transfer function is networks the magnitude,1/√1+T-square.Csquare. phase shift network..
Vi/Vo=1/RC/JW+1/r.c ..test close open system ..
Test generation : phase synchronous machine electromechanic energy conversion device operate on synchronous,speed,of rotating magnetic,field , synchronous machine,based energy, synchronous generator . synchronous rotor .
- NS =120f/p, f the supply ,p is the number of poles in machine,
Working principle
key principles
key features : sychronouse motor asynchronous motor ..self starting , synchronous machines excited machine requireded,machine two applies one DC , synchronous machine operate at constant speed called synchronous speed, generator voltage of constant magnitude can be operated, lagging, leading unit , synchronous motor relative, ,
Test daily week time load
Relever trade. Integral derivation day

Unity descrition	Yes/not
Equation of sychronouse motor . V=Eb+Ia(Ra+Jxs). Voltage v.eb back EMF .is armature Ra armature resistance .on system day working duty shift -resultant voltage: difference between the voltage applied v.and back EMF, E=V-Eb,. Er=Is.(Ra+jx.s) Back EMF generated: Eb=ka.¶a.Ns ¶a= constant of the armature,¶acmagnetic flux perpoles, NS = synchronous speed of the rotor .En=v normal excitation lagging power factor EB<v under excited.over excitation. Input power: input of synchronous motor .Pin=v.Ia.cos¶ per .phase .Pin = √3.v.I.Il cos 3phase .. Mechanical bpower in rotor Pm=Tg.NS Pm=En.Ia.cos(a-¶). . Pin =√3.vl.il.cos¶-3.I square.ra.. Pm=pin -Ia.Ra..	

A load angle between en and v, angle between band Is ,the is gross torque products .Na is per synchronous. - stepper motor Ster angle ..£=(ns-nr/nsxnr)x360. Step angle the angles of rotation of shift .NS = number of stator / number..poles .Mrs of poles Motor asynchronous..nr-ns/NR slop squirrel..star current as..z.c .p. DC motor machine .. Resolution 360degre/ beta accurate of stepper .n motor speed.n. Requireded learner induction machine system engineering electrical St peace generation GB ..machine system hr resource compatible run .-transformer three phase Connecting start delta zig zag.primary wind , secondary winding, . interconnected order phase clockwise power . Y...VP=Vl÷√3. Vol=√3xvp... D. VP=vl...vl=p.. Y.Δ. Turn ration TR=NP/Ms=VP/√3.v.s.....1/2....step=1/,√3 Δ.y....TR=Np/NS=√3.vp/v.s .Delta delta line vol primairy secondary vl~n.vl...line current primary IL/n. Delta star vl_ √3.n.vl. ..Il = IL/√3.n Start delta ..vl_n.vl/√3...IL=√3.il/n.. Start start vl =n.vl I=IL=IL/n... Estimation data 50 Va supply,line voltage 100v , primary turn 500,	

secondary turn 100, n=NS/nP=100/500=0,2 ..vline sec =√3xnxvline =√3x0,2x100=34,64volt -V phase sec = v.line /√3=34,64=√20 v. ILine (p) = Va/√3.v line =50/√3x100=0,289 Am.. I sec = ILine = ILine (per)/√3*0,2=0,834 amp.. construction... Transformer voltage regulations.. Voltay regulation or percentage value by which transformer output terminal voltage varies, up or down from it load value... Condity when IL = 0 open circuit to fully load IL= iMac maximum current for a constant primary. , Regulation=change in output voltage/ no -load out voltage Regulation = v(no load)- v (full-load)/v.no -loAd.. - percentage % reg (down)=v(no-load)-V(full load)x100%/ v no load . % reg (up)= v(no - load)- v (full load x100%/v.full load.. Estimation transformer has open circuit no load terminal voltage 100 volt and same terminal voltage drop 95 volt on application of connection load transfo regulation ..0,005 or 5% ..(100-95)/100*100% V1 <E1...E2=I2.Ro.xos2+I2Xo2.sin&2+v2 V2>E2..E2-V2=I2.Ro2.cos2+I2.xo,. Capacity load x 100%	

40.2 required purpose.control .lab

-introduction lab is to investigate application of embedded control controller to real time algorithm that employee analog input and anslog outputs engineering electrical St peace college time table and city power training days care computer algorithms to implement a closed -loop processor from machinery or motor speed hortorinh .conduct system manager security physical.hin feedback can used to lineare inhertly non lineare process and results in zero steady state control errors,
-objectivity assignment engineering electrical time table and training city power St peace college.
1.general power output to implement system management variable machinery motor supply voltage.
2.implement a tachometer operation using pic timer engineering electrical and trade.
3.develip program code academic to implement a picture

40.1. requireded: case student training practical school and practical schools engineering faculty, saqa registration .setat registration St peace registration
Practical school learner secreatairy help school efficient ly by performing clerical task support principal,work in building along with parents and student school often .school mission career, no formal edu post high school college St peace ,job gate welcome visitors,students making appointments,maintening student record handing incoming and keep the school website event update calender ..St peace training and city power training to city calendar.
40.2-question how to construct impressive teacher Portofolio learner training . Portofilio evidence.career job .degree scotllande .
40.4.education leadership and management .St peace college and city power management trainings work subject.
-School engineering electrical training practical governance .online master of educational management on line honour leadership inovation.bucheler saqa qualifications award degree diplomat learner practical,
-40.5 guide formative training homework qualifications saqa diplome d etat homework back laureat
Management school...gestion school established school modernization exigence democratic.registration inscription student generation attributes.card admnission
. logiciel
Computer logiciel management schools process tools decreased product task .modules function information school college admnise division ,class St peace , management of campus.management student status, tutorial family.
-Management faculty eny: classes engineering electrical lecture professor and training.planing honorable planning, assessment.yes
-management examination time table.inspection work permit at peace college adm I, exam questions attributes classes evaluation scores,genure reports
In city power external training job

- management schools fee bursary Engineering.step.
.
-principal planification . organisation orientation school professional St peace college manual guidelines, administration school at peace give to learner policy instruction assessment learner to participate in circulum and visited subject.
Test
PC school air time
-functionnality test education program .note globally service global services client . functionality,rapport .quality.
Administration at peace collt give
.the role of school management.school date the class and the power hierarchical function activities roles function rectorat at peace college and charge of training external company government definition.orientation school professional source stress school stress .
The level students adapte situation place social development projects government state teacher inovation democratic acess in the age of leave work children. child care . level diplomat.
Time table admnise evaluation statement report teach class subject counseling portofilio.means transport place .source difficulties for training transport.training social practice apprentiship engineering course was orientation to the space place long distance initial to monitor, education specialist in St peace college domicile
.filing animation social model
.-.the administration workable of Poste school . description post admnistrator supervisor.task school admnistrator college etablissement good function to teacher vocational and the trainings .
Task functions.budget manage logistics give line to marks reference.
-chargr admnise to coordinner all the process admnistrator management political and evenement .to resolving conflicts problem school in training external.to response counseling students resolve conflicts
-legislation school subject after assessment Portofilio evidence learner excepter deall misconduct pffense discovery learner in St peace College.
To city power work.
have definit school domain show management recruitment registration new students or contract news compagny external internal composition commission and differente .,
- counsel teacher difficult entry dismissal.procedure.prise ,
Commited management schools circular framework.importance,
- to have definit sanction and reward primary deceive procedure input in case of abandoned post graduate or leavers school to practice or irregularite . sanction in education News legislation.or skill development implementation learner.in St peace college.hr ruling .
-practical school report rwiten efficient parental learner in induction learning student at peace college to going to city power to complete a project class assignments.assessment year report primary tracker run circular summative.and for formative assessment,score built ,in mark sheet

design range subject investigation different results.expectation accrose range assessment results.defineed and speedly asssessor workbook strategy report run regular census data cloud policy,
- week course audiovisual and social class room creation ICT technology digital tools learner critical digital literacy , -international studies in educational inequality theory .skill student basic employee in access to different level level of education academic understood generalite theory outcomes system worked primarily school junior .ethic deontological generality legislation school ruling resourcereality legislation school and principal admnistrator act importance in saqa qualifications citysen to frequently industrial.
-Duty of chief college and department management schools, . political public education state evaluation,control priority norm posterior.level organisation type model office bureaucracy.
_flexibility of circulum,
-caracteristic of students and training St peace college to training caracteristic job compagny city power,to give a good operationel results projection goal target day visit,
-management leadership measure political principal objective professionalism in job training caracteristic direction ordering collegial.counseiling director .
Management intermediate division organique function authority administration directives, professional and pedagogy training, execution government, judiciary low . legislation low schools.functionnel authority teach assure orientation coordination pedagogy
-.situation curriculum flexible examen national Central administrative contract d 'autonomie protein project study chief of .changement of authority power of teachers society civil offer influence democratic in circulum asssessment.and training examinator

_

to me

50.2.Requireded: engineering St peace College, ensuring maintenance care components discovery,idee improvement tips self no coping constructive bridge design ,defey force militaire operation ,
Policing investy resolve of crime frame work regulatory collating information indentify crime , engineering,
-Defense militaire operationel force
-mil STD 13231, content ,paragraph application general ,standard ,other goverment ,

publication ,order of precedence , definition , commercial entity gage , commercial off the shelf cot product, containers,decalmane,design activity documents functional marking engineering, -joint electronics type designation system industrial St peace college .industrial electronics safety factor low defender land.
-Manufacture identification, nato supply code for manufacturer nscm , nomenclature,order of precedence, part number identify number safety electrical trade theory safety manufacture sabs sans health outcom .
Procurement instrument identification number,set selected item ,drawing ,sequence marking unit ,safety and police framework low system manufacturers St peace college , General requireded general government name and type number ,join electro design system ,St peace college CCTV ,alarm safety trade control system offensive training marks manufacture award ,
Army nomenclature system identification number :I'd permit St peace ,inspection contractor Gove gagr identification b,
Limited used multiple use special item identification college , use of unity pack bag, reference design goverment bdesignAtor, reprocurement,electronics tubes electrical part tubes, name plate data for article,special requirements for marking of container, identification of set article of or , indentification,marking articlevbatterie warning high notice radio active,ion ionising radiation,technical literature caution:safety electrique OSHA sabs IEC commission St peace college system manager, schematic wiring and cable diagram , chassis identification modification work order number, sensitive electronics device,location of marking ,general marking process: ,marking on surface size and form of character label,material process radius of careers ,mounting mountain spectral Gass opacity permanency Nd durability,facsimile,issue marking for air transportable reprocurement perman y legilo,subject .
50.3 system engineering management, system engineering process ,sabs sans St peace time table outcome career engineering safety electrical engineering generation transmission.assessment require
, requireded process and analyse allocation , function analyse allocation,design synthesis, verification, system engineering process
-system analyskse and control ,workbreak drain Struct,
technical review trouble
model and simulation .metrics .risk management risk management
Planning organising.product improvement strategy organisation and integrating system development, contractual ,
-system engineering fundamental introduction,: general , application,referred facility grounds system grounding Nd power distribution system ..St peace college safety career generation.policy
Bonding shielding and grounding relation grounding safety..relation investigation low cabling geotecnical city power Eskom and customer occurrences repot.
- lightining discharge fault protection noise reduction summary of requirements,resistance to

earth communication lightning requireded typical resistivity summary,soil effect effect, measurements of soil resistivity, measure technical ,one electrode method four terminal ,earth electrode , system,general ground rods buried gride plate s metal frames,water incidental metal, resistance properties simple isolated electrode ,,
Transient impedance , electrode ,fall of potential metal extension ,test paint
- lighting phenomen influence of structure height ,strike like hood attractive less than 1000,flash parameter mechanical thermal conductor impedance inductor capacity couple earth ,
-fault protection :power systems fault ground circuit interrupt, Conductor direct current resistance, alternating current impedance skin effect AC reactance proximity effect, resistance property vs impedance property , effect geometry,standee cables , rectangular Conductor tubular Conductor, structural ,
- signal substem : networks configuration..signed point ground lower multi ground higher frequency plane
Defense mil STD 1285D,
Fsc5920,, circuit breaker FSC 5939 switch thermostatic switch rotary shall sequence counter,open frame construction color passed molding,Google switch ,printer wiring stddata regardless,data is applied directly surface information described , intend ,use ,issued of DoD marking for shipment,serial transportable item reprocurement,permancy legibility,name caution plate caution ,
Mil 200 system reference goverment ,non governmental whose identified gate drawing format size letter and .drawing numbered system duplicate of assignment number,
Output.physycal architecture product element and software code decision database.input function architecture,enabler ipts decission database automated tools models,
-control constraints gfd cot resablr system ,concept substem choice organisation procesudure, Reusable SW system concept subsystem choice ,
Activities: allocated function and constraints to system element, synthesis system element alternative, asssessor technology , alternative, definition physical, definition system products wbs development life cycle technical integral system select preferred concept
P.E=q.v q.is charge moved voltage rate doffence other change.
P=I.V....E=P.T.,Talk= resistivity .l/a ,
H= Δc m.(T1-T2)..
-Pl.=v.i.cos..
IL=p/v.l.cos unresolved transmit 1009.10 m w..at 10.kv.resistance of 100km...
Wath current need to transmit
:
Requireded: metering system decimal relay rotational test ,sequence line,cut off ,direct switch register ,in the group in which the calling division starter search for pilot switch .a time device, switch finder respond pilot ,switch final connecter ,signal controller send impulse stepping ,interconnector ,div ision ....
Alternator . Loading effect heater current

50.require regime sinusoidal

Transfor mer Group 1 hour induce clockwise radio .. Group 1, hour indice 0,-4-6 Group 2,hour indices 0-10-2 Group 3,1-3- Group 4-2-11 Connection couple YY. M= n2/n2. Y.d. M=N2./N1.√3 Dy..m=n2.√3/2.N1.. U1.=4,44.n1.sfb.. N1=u1/4,44×sfb.. Loss ion .copper. : Uco.Ico.cosπ ZS=m.U1/I2... Model: fresnel diagram .. existing Constance kapp E=V+Ux+UR I1(t)=IMAX.cos(wt) I2(t)=IMAX .cos(wt-2π/3) I3.(t)=IMAX.xos (wt-4π/3) H(M,t)=3/2.Hmax cos (p@+wt)	

Point award 102.

Point have awarded skill 80 point responsibility 25, mental effort 25.working consider.merite

-Determining the wage :

Job classes and average

A 60,B65 ,C 70 ,D,80;E80,C85,

I stitu good task .

Task exer measure responsible judgement application of technical legal account statistics engineering.

Abscent .labour overall...

-Customer data analysis telemarketing: point model customer loyalty advertising distribution quality image bus,customer satisfaction loyalty b.

Distributor performance

Distribution vservice ranking ,overall performance brankibh rankingbdifference .. custom ER returned St peace college time table .an city power metering

-

Item report financial mode product .RK 1mB memory's

Specifications

Display ooerater

Printer print meter

Memory back

Power consumption operating dimension,AC 120v, 99;day data

Label printy

Power requirements

Power consumption

Operating tem.plotyer size.product ...

-Personal call plan

Telephone call plan matrix customer number metering code

Level factor call plan ..error association observations .level call plan analyse market .

Winner trading plan.nwt profit bnumber win pay out number .proffi loss ..

Bulletin trade test job returned posted job postponed.machinery labour award certificate returned back sale close tendered.close maintenant manufacture invention supplies.policey returned award low,cost

Point award 102.

Point have awarded skill 80 point responsibility 25, mental effort 25.working consider.merite
-Determining the wage :
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Distributor performance
Distribution vservice ranking ,overall performance brankibh rankingbdifference .. custom ER returned St peace college time table .an city power metering
-

Item report financial mode product .RK 1mB memory's
Specifications
Display ooerater
Printer print meter
Memory back
Power consumption operating dimension,AC 120v, 99;day data
Label printy
Power requirements
Power consumption
Operating tem.plotyer size.product ...

-Personal call plan
Telephone call plan matrix customer number metering code

Level factor call plan ..error association observations .level call plan analyse market .
Winner trading plan.nwt profit bnumber win pay out number .proffi loss ..

Bulletin trade test job returned posted job postponed.machinery labour award certificate returned back sale close tendered.close maintenant manufacture invention supplies.policey returned award low,cost

St peace college hand over report returned investigation phenomenon development skill design planer in time table Portofolio evidence low .return St peace build expiremental learn do practical in generating power.station career .science student knowledge obtain engineering electrical in installation day month log activities career inovation.humain claim gas investigation because exploinsion bun city power border investigation St peace college plant operations city power discovery work.and definition professional..
That conduct research student St peace field career generation metering in city power.to ensure city power operationel plant part and maintence components bcity power understand science b to develop circuit calcul must go..to planing city power road going ..nature idee time table.. revolution in city power accessories to devices critical eayes observe custome in city power creation idee.implenting time in city power cited plant and author industrial society and force defense and police security.
-defense military engineering.police development systems information in city power inovation skills mean creative new idea access student in training be researchers..

-

:
Requireded:lamp tungsten filament, typical lamp incasecent tungsten filament, tungsten halogen, mercury vapour, fluorence tube,metal handle,high pressure sodium, mercury vapour same,
-typical application general purpose Tash lighting large area commercial.
-efficiency luminescent 13-30,40,to,130,
-bulv lift hour,dining controk, excellent, starting time promo,colours
- energy saving,lamp colour,luminaire, utilisation factor reflection,direct and occupacity movement ,
Power 1000, voltage 249,ano4,2, a,b,v 1,6 m coverage n/a over head mount eater dimer wxHxD
- determine procedure when planning installation.
BxDx heam index)100= totak kWh requireded .
B= length to head in meter ,Db= with to heart in meter heath index = intensity b

50.1 radiotechnic : power amplificator TV sons base oscillator line pentod. Input out put. Control system
Caracteristic: eat indirect cathode insulated wire Vi6,3.
-source wire

- use conditions nominake rms Voltage anode. Va 179..250 v Voltage grille vg 170- 259 v Current .62 to 2,4 ma, Coefficient amplificator 10 ,15 ohm Resistor internal pent 0,2 4,6 mA Capacity grille ,capacity anode ,14,7pf,anode 0,4 capacity anode cathode CAG less 0,8 of , Value limited peek voltage vap max 7 kV, voltage of anode Va max 300 v,voltage grille 300v, cathode current max 30w @89 MV ,8,5 Installation light tube amplifier input Telemer video output pentod,power pentod,flip -insulatiin in receptor conversion in case we Cree out mixage voice voltage insulator mean level of power Heater nose IR(t)=VRFcos(wo)=I(t)+Δv1. QR(t)=VRFsin(wot)=Q(t)+Δv2.. 50.. Requireded.rypical telecommunication street distribution for new urban resident using side. Legend electricity pedal,rod wat,lot 79,,asdl signalmstreet cable ,concept,asdk modem customer, -Typical underground copper twis par network telephone exchange.. Cabling of homes telecommunication completed fuid to home line mode possible fault to comming the telephone voice port fault to switch relay connection -basic home network system typically cabling connection	

telephonic and data services. Legend . modulation socket,modulator coaxial socket,optical.. Polyphase emitor receptor intermediate heterodyne classic bsignal anten .module phase Phase shift - canal of transmission GSM interval area antene to cell phone.. BTs yes BSc yes msc yes network...wave electromagnetic fix plane impedance caracteristique area E,/H=377, numeration fibre coder filter decode input 300,Hz out put 3,4 khz 13 bit recharge system energy product restore.. battery,, returned	

50..
Requireded.rypical telecommunication street distribution for new urban resident using side. Legend electricity pedal,rod wat,lot 79,,asdl signalmstreet cable ,concept,asdk modem customer,
-Typical underground copper twis par network telephone exchange..
Cabling of homes telecommunication completed fuid to home line mode possible fault to comming the telephone voice port fault to switch relay connection
-basic home network system typically cabling connection telephonic and data services.
Legend . modulation socket,modulator coaxial socket,optical..
Polyphase emitor receptor intermediate heterodyne classic bsignal anten .module phase
Phase shift
- canal of transmission GSM interval area antene to cell phone..
BTs yes BSc yes msc yes network...wave electromagnetic fix plane impedance caracteristique area E,/H=377, numeration fibre coder filter decode input 300,Hz out put 3,4 khz 13
bit recharge system energy product restore.. battery,, returned metering overload system
:
Requireded: electrical, standard characteristics, standard, electrical equipment, circuit,cables and wires,electrical fittings,TV,FM communication and security home automation, system , accessories certificate of compliance,sub -contractore rate,
- electrical installation in homes up to electrician light plug point position advice in valuable regulation, electrical layout ,number point , connection ,stoves,geyser, the electrical distribution system , planning ,number appliance, planing ,designer manufacture be sider ,increase ,the wiring of premise part low voltage installation, refer sans 10142.
Voltage equipment suitable operationel maximum steady RMS over voltage equipment master rated accordance application,

-single phase 230/240,volt 60,89,50,Hz standard frequency for netral sans .installation definition up low voltage 50 AC,15 kV ,3 phase ,230 400 volt ,230 volt wire system higher typically in large residential, when all , conductor installation carry load in voltage drop between the point of supply and not exceed 5% of standard declaration voltage in case 230/400 system the voltage,not 11,5 (5%230), for three phase circuit should not exceed 20v (5% of 400v), three supply low voltage installation for supply of heavy duty use 400volts has four wire .three phase red white blue ,one neutral, .neutral Blac or blue, wire voltage , lighting . circuit Conductor,

- Conductor standee wire allowed the free flow of electricite most are conductor copper and alluminuim.heavy expensive, 1,A,100m ,
- compulsory standard: specifications for circuit , breaker govment notice Gasset 20461 of 17 September 1999.Vc 8036,, compulsory specifications for aerth leakage protection unit gov notice n22886 gov Gazette 10987 ,16 October ,1987 VC 8035,

Compulsory operator switch for fixed installation gov Gazette, compulsory socket adaptor gov notice R442, compulsory specifications for safety of electrique cable with extruded solid dielectric insulation for fixed Vo 1900/300 notice R1169 gov gasette , compulsory specifications b, flexible cords ,electrical appliances notice ,sans 10142 sabs 0142 is concerned with ensureing the basic safety safety bof electrique installation ,

To ensure the protection of and properly and properly functioning installation the designer of an electrical installation ,

- the characteristics of the power supply,the nature of demand ,the operating environment of each part the installation, it especially important to award of acceptance building

-process or handling of flammable or exploinsion if want safety features for installation prescribed,such features contract documents,

- provision of sans 10142. Apply only to the selection and application of electrical equipments and accessories which are part of the fixed electrique installation, they do apply to the construction and safety of equipment appliance and accessories..

Foundamental safety live part test finger,during normal operation .permit normal operating conditions temperature safe 70 celcyis,90 bin case metallic part earth

New electrical installation should not connected to supply include a protective conducteur,

-use electrical equipment insulated, ..

Installation replacement installation should accessible ajoining premise building there is easy access to it location ,it is not like physical damage,dust moisture accumulation on liver ,

- Distribution board ,in case requireded sans 10142, function safety equipment number circuit road ,mounted dange notice appliance or in position stationery cooking enclo extended,
- busbar bare copper aluminium conductor fixe test circuit breaker unless fully test sans 60439 - I / IEC 60439-1 sabs IEC 60439; the current density of copper busbars must not exceed 2,A/mm sq for current 1600A, 1,6/mA/mmsq, l1,l2,l3 code .
- disconnecting devices:

Transformation disconnect switch supply disconecting devise control .

- Circuit breaker: circuit breaker open switchh automatically over current protection RCD residual courent ,clause 4, sans 10@42 alternatively switch load and line miniature circuit breaker 1A to 100A,
- Earth leakage protection: one of the main risk frame fault installation supply sans 164-1 sabs type outlets in existing installed socket outlet rewired 3 phase neutral complied sans @64-4 surfer 16 A intended for connection surge protection sabs IEC 60309-2 and of dimension as sans 377 377 stove couple,surge due power systems operational number buildings area 180m sq on height 69 m strike 12 years line expose .
- circuit.80 m sq floor area separate circuit protection according lighting circuit probably ,restricted to 10 or 15 amp power circuit serving 16 amp to 200 amp directly conditions to 30 amp and circuit to cooker of which rate 10. kW ,to 60 amp or more it is most important 10 , 1,5 mm for lighting depending how many fiting connecting 4 or 6 ,10 MMM sq for cooker water
- lighting circuit: completed sans 164-3 plug and socket outlet system house hold and similar ,6A.,250V ..A.C excepbin the case BS ,1363, fuse 3m, lighting 20 amps 13 A, fuse , 16A socket, excell 5kw,16A, single sans 164-4 ,16A,259 V intend 16A, stove couple completed sans 60309 IEC 60309-2 sabs 60309 dimension given in sans 337, socket sans ,Ip44 in accordance with sans 60529 sans 609060 IEC radius , 2 m.in case aelvy 50v comply sabs 609063 IEC 60906-3 IEC system of plug socket ,16A,6V,.. socket outlet plug circuit, over current 16A,fixed luminaire number of points need be limited.
- Mixed load circuit: Disconnected close proximity 16A, /. 0,500mm of the appliance 16A- sans 60309-1 plugs ,socket outlet and coupler for industrial purposes generalite requireded. Sabs IEC 60309-1 dimension sans 337, sans heater ,16A power ..
Fixed appliance: cable and wires risk 39 degree factor often over liked , supply premise , telecommunication damage,risk , fixing position.
- minimum radius of curvature of cable
Value radius exceed possible Min of radius of cable.
Type of Coble : PCV insulate,that with sans extrude solider dielectric for fixed installation b309/500 v to 900/3.300v .,papper insulator,
Type of shearing : unsheathed sheathed unarmoure ,.
Diameter of cable d<10, 10<d<25,,25<d<40..
Minimum radius of curvate 3d,4,d,8,
- common cable types: open wiring 250 protect above Arial cable ,surfix ,flex or reciprocal ,cab tyre,house wire
-Wire size and current ratings:
Core size wire size mm.sq 1to10
Current 13 to 54.
Wattageb3,25to 12;
-typical Appliance : lighting , powe circuit.

- maximum cable circuit length at gizwn circuit breaker
Nominal cross section area mm sq 1 tib16,
Circuit breakers current rating among 19 to 109, power factor in unity maximum permissible voltage drop between phase and neutral is full circuit breaker loading is 5% of 239 v ,. 11,5;only
-core size wire size mm 1,5 to 24,.
- current 18 tib1000,:.
Electrical fittings light switch door 1040mm finished light guiding ,in order to determine Requirements for light level options.push dimming versus ritory ,level option .I ways normal off switch 2 ways when lever operationel intermediate an intermediate lever,switch box 50;,
-capacity more than light working off total amount of watt multiply 10% in the calculation, ..8x59 w dow light= 400w , 400wx1,33=533,. 533+53, 19% 566 it show 600 , socket outlet plug ,. Single or double 16 amp 16 amp
-TV FM communication and security:
Telephone Nd data socket bell press, TV,FM home movement detector base on passive infrared PIR,protective switch,accoustish,beam interrupting detector,glass break , vibration sensor,CCTV image detection it recommand that where possible products be used evaluation compliance.
Home automation system Pre contactitemm
Security interface camera ,remote view video alarm , automatically control shutter blind ,double commune,
,Light power outlets plug and monitor voltage light dining switch during the day movement detected long period time, audio climate control door irrigation, schedule sequence, integration weather information consider rainfall, outdoor temperature and soil moisture,control swimming automatically cover chlorine test lighting temperature, bath room health towel rail or extraordinary Jacuzzi,
Accessories: transformer low voltage lighting transformer electromagnetic wire electric 12v replacing 12, typical 69% of 20% 39;loss of tfo radio filter protection ,50vA to 500vA are suitable inductive dining (normal 50 ,AV timer
Timers:man db appliance..
-
Energy efficiency occupancy.,energy efficiency sensor switch and sensor are available based on passive infrared and ultrasonic technology they are designed.
-Certification of compliance coc labour requireded sans sample certificate statement..
estimation years type electrical number poles current rating short fuse ,239,400 523×In = KA..
Switch disconecting.
-laege plant products rate,up date,selling ,
Demolition compressive sans 50197
-codr analyse concrete
Labour rate guidelines: concrete grade 1,2 ,skilled worked semie skill general worked ,total cost day,
- wage per days .

-Sub - Contractor rates
Electrical sub contractor rate
Description../unity// price
- basic db 3 phase install ,each,R9,500.
- basic distribution board install each R6,5900.
-3phase lighting protec each R 850,00
- fit ripple relay geyser R859
-fit sub board build R2,759
- supply and lay 3 phase cable form boundaring metre R 129, supply and lay 1 phase cable from boundary metre 35 .00
Cable to external light metreR 69.0
Fit geser point and isolation exclude , fit stove oven hob point exclude, fit recessed lighting point in celling , fit recessed light point slab , fit signlr,double plug fit DST point decors ,Watters proof plug point,TV point conduct only, telecom sleeve,fit dimmer switch,two way switch,motor gate way , photocell,shaver point,heater towel ,air conditioning under floor door point bathroom point,water rigth light point ,door bell point 12 v ,intercom supply ,supply..
Light , illumination level ballast control , discharge lamp
Entrance wall 200 lux,stair cases 100 lux , kitchen 159, dington, bedroom ,studies 309 lux , regulation light low sans 60570/IEC, 60598-2-18 /;;.
Geyser pressure ,pressure control valve, expansion relief, safety valve ,
Lamp incandescence bayonet, Edison screw compact fluorescent,tungsten,halogen,metal, 6000h,3hm colour,14000 to 2400

-

:
Requireded.: Assessment St Peace college contract learner.skill career development,science electrical

Homework class work.assessor conductor engineering.

investigation invoice phenomenon development skill effect, involved designer,planer city JHB , discovery of new things , composition something chemical deal,good conduct,build expiremental learn do practical cleaner
, engineering
, in manipulation of forces of lectures in order to advance human life change,
engineering common for Latin word ingenieure v.means to design .to design to device to mark:

Word to perfait 2 G generalite, successful engineering must improve the quality of life ,
-science is the study of the nature and behaviour of natural thing and the knowledge that we obtain them .
-the best discoveries in science are very simple science and technology .
- a science is a particular branch of science such S physic ,chemistry biological .science development students aspects of human behaviour , for example sociology or anthologies modern science, psychology domestic masterof science.
- investigation investing if someone, especially N official investigation N event situation or claim they try to find what happened or wath is the truth gaz officials Re investigation the cause of an exploinsion which bodily damaged a house homsphire police still investigating how the accident happened he ordered an investigation in the affaire,
-engineering is work involve in designing and constructing knowledge, impossible tungsten while neutral earth resistor mega watt.
-Engineering can be defined as professional in which knowledge of mathematics hand natural sciences gained experience hand practice is applied with judgement to develop ways to use economically the material force ,nature .wath engineering do conduct.
- I research in advanced field aerospace chemical.
-the development lab workspace in workstation shop find tender..
-the test and verify they founding.
The use analysis en everything the do such the components development.body
-the involved in construction or building of new model
-the ensure the operation of a plant place making .
-the ensure the maintenance components of the plant part.
-the offer technical support no water to go found water,
-the are consentence engineering ,
The must understand mathematics hand science .
Designing, NY system to develop must undero design,you must become devil risk tak,planing give a clear road map ,or direction,
Every work done perfection is done twice concise , I planned, I actual,an ideo be born I your mind , you nature idea ,next year no say that .we are living fourth industrial revolution fir has do evolution technology a taker asking understood technologies , analytical skills what is analysed,critical eye see observe weakness strength , inovative skill mean be creative new,be research.
:
-40.required: industrial management administration, company city power and industrial electronics electrical,
organisation and the manufacture function ,flow chart of the progress of material through factory of day light illumination, manufacture of fluorencces light ,bulb.and appliance time table St peace college.
Organigrame . algorigramm.principlev

line, bloc
-rougth casting metal unload of metal story yes r.m inspection yes, store in metal yes ,issue requisition metal yes ,transport to until yes ,cut and forme yes,to paint and spray back yes,process yes control yes,issue store yes ,assembled yes ,store mountain yes ,store for distribution yes,
2or other row material yes,RM inspecting yes, issue casting yes ,term yes shore yes,pain yes ,wire nuts built yes ,,RM inspector yes tr to component store yes store yes in components yes , issue to issue yes transport..
- critical path analyse ET Earliest time, latest time, preceding event, marketing, recruitment assistance,record assistance, education training, recelare industrial relations, event , marketing
-education training ricelarise industrial relations,
- Observations: last time in minutes waiting for instruction compensation getting out tools,locking interruption by firmament, total, prime cost variatan e, break even analysize fixed cost ,marginales,sales revenues,total cost ,trade mark , relation good

-work study time advisory, design step1,2,3,4 test Mount wire assembly,order an purchase, orders and purchase
40.9. requireded maintenance ..maximizing equipment effectiveness: measuring availability .
Availability= operation time/loading time
=Loading time - Downtime/loosing time.
Available=400 minutes/460 minutes ×100=87.
-operating =0,5 minute/0,8 minute ×100=62,5%
-net operating rate = actually processing time /operation time
=Process amount ×actualncyclebtimr.
Net operation .
Rate =400item ×0,8 minute ×100/400minute ,
Performance efficiency= net ,= operating speed ,
Processed amount x actual cycle time/ operation time
= 400(item)×0,5 minute ×100/400 minute =50%
0,625×0,625×0,80×100=50%
-A . workings hours per days 60 Min ×8h=480min
-B.plane down time scheduled.
C. Load time per day =A-B= 460
D: stop losses perminute break down,20 minute.
E: operating meter day ,C-D= 400 minute
G: out per day =400 items
H: rate of quality products 98%,
I: ideal cycle time :0,5 Min / item
J: actual cycle time =0,8 Min
F: actually processing time =jxG=0,8×4000.

T: availability=E/c x100=400/460×100=87%
M: operationel rate = I/j×100=0,5/0,800×100=50%
-Overall equipment effectiveness=T×L×H×100=0,87×0,50×0,98×100=42,8
-equipement.: 1Loading time ,operating time ,net operating time,
2Sigx bx bag loss: equipment failure,St and adjustment, idlian minor stopp,reduce speed ,
Calculation of overall equipment
-1availability= loadtime -downtimex100/ load time.
- 2available=460 min- 60 Min×100/460=876
-3performance theoretically cycle time×process/time operating
Performance efficiency=0,5 Min ×400 unit/400 ×.100 =50
Rate of quality = processed /amount defective/processed .
Rate of quality products=400 units -8 unit /400 ..
Overall equipment= availability ×performance Efficiency ×role of quality..

50..Requireded..dti labour exam.and labour appliance time table availability.break time table exam operationel time table management system information.st peace college performance.. competency engineering implementation.. development social infrastructure in gov energy's department..
Actually process irregularite final.regularity compensaylabour .to skill city power visited ... system..

Requireded: engineering St peace College, ensuring maintenance care components discovery,idee improvement tips self no coping constructive bridge design ,defey force militaire operation ,
Policing investy resolve of crime frame work regulatory collating information indentify crime , engineering,
-Defense militaire operationel force
-mil STD 13231, content ,paragraph application general ,standard ,other goverment , publication ,order of precedence , definition , commercial entity gage , commercial off the shelf cot product, containers,decalmane,design activity documents functional marking engineering,
-joint electronics type designation system industrial St peace college .industrial electronics safety factor low defender land.
-Manufacture identification, nato supply code for manufacturer nscm , nomenclature,order of precedence, part number identify number safety electrical trade theory safety manufacture sabs sans health outcom .

Procurement instrument identification number,set selected item ,drawing ,sequence marking unit ,safety and police framework low system manufacturers St peace college ,
General requireded general government name and type number ,join electro design system ,St peace college CCTV ,alarm safety trade control system offensive training marks manufacture award ,
Army nomenclature system identification number :I'd permit St peace ,inspection contractor Gove gagr identification b,
Limited used multiple use special item identification college , use of unity pack bag, reference design goverment bdesignAtor, reprocurement,electronics tubes electrical part tubes, name plate data for article,special requirements for marking of container, identification of set article of or , indentification,marking articlevbatterie warning high notice radio active,ion ionising radiation,technical literature caution:safety electrique OSHA sabs IEC commission St peace college system manager, schematic wiring and cable diagram , chassis identification modification work order number, sensitive electronics device,location of marking
,general marking process: ,marking on surface size and form of character label,material process radius of careers ,mounting mountain spectral Gass opacity permanency Nd durability,facsimile,issue marking for air transportable reprocurement perman y legilo,subject .
50.3 system engineering management, system engineering process ,sabs sans St peace time table outcome career engineering safety electrical engineering generation transmission.assessment require
, requireded process and analyse allocation , function analyse allocation,design synthesis, verification, system engineering process
-system analyskse and control ,workbreak drain Struct,
technical review trouble
model and simulation .metrics .risk management risk management
Planning organising.product improvement strategy organisation and integrating system development, contractual ,
-system engineering fundamental introduction,: general , application,referred facility grounds system grounding Nd power distribution system ..St peace college safety career generation.policy
Bonding shielding and grounding relation grounding safety..relation investigation low cabling geotecnical city power Eskom and customer occurrences repot.

- lightining discharge fault protection noise reduction summary of requirements,resistance to earth communication lightning requireded typical resistivity summary,soil effect effect, measurements of soil resistivity, measure technical ,one electrode method four terminal ,earth electrode , system,general ground rods buried gride plate s metal frames,water incidental metal, resistance properties simple isolated electrode ,,

Transient impedance , electrode ,fall of potential metal extension ,test paint

- lighting phenomen influence of structure height ,strike like hood attractive less than 1000,flash parameter mechanical thermal conductor impedance inductor capacity couple earth ,

-fault protection :power systems fault ground circuit interrupt, Conductor direct current resistance, alternating current impedance skin effect AC reactance proximity effect, resistance property vs impedance property , effect geometry,standee cables , rectangular Conductor tubular Conductor, structural ,

- signal substem : networks configuration..signed point ground lower multi ground higher frequency plane

Defense mil STD 1285D,

Fsc5920,, circuit breaker FSC 5939 switch thermostatic switch rotary shall sequence counter,open frame construction color passed molding,Google switch ,printer wiring stddata regardless,data is applied directly surface information described , intend ,use ,issued of DoD marking for shipment,serial transportable item reprocurement,permancy legibility,name caution plate caution ,

Mil 200 system reference goverment ,non governmental whose identified gate drawing format size letter and .drawing numbered system duplicate of assignment number,

Output.physycal architecture product element and software code decision database.input function architecture,enabler ipts decission database automated tools models,

-control constraints gfd cot resablr system ,concept substem choice organisation procesudure, Reusable SW system concept subsystem choice ,

Activities: allocated function and constraints to system element, synthesis system element alternative, asssessor technology , alternative, definition physical, definition system products wbs development life cycle technical integral system select preferred concept

P.E=q.v q.is charge moved voltage rate doffence other change.

P=I.V....E=P.T.,Talk= resistivity .l/a ,

H= Δc m.(T1-T2)..

-Pl.=v.i.cos..

IL=p/v.l.cos unresolved transmit 1009.10 m w..at 10.kv.resistance of 100km...
Wath current need to transmit

Requireded: metering system decimal relay rotational test ,sequence line,cut off ,direct switch register ,in the group in which the calling division starter search for pilot switch .a time device, switch finder respond pilot ,switch final connecter ,signal controller send impulse stepping ,interconnector ,div ision ....
Alternator . Loading effect heater current
50.require regime sinusoidal
Transfor mer
Group 1 hour induce clockwise radio ..
Group 1, hour indice 0,-4-6
Group 2,hour indices 0-10-2
Group 3,1-3-
Group 4-2-11
Connection couple
YY. M= n2/n2.
Y.d. M=N2./N1.√3
Dy..m=n2.√3/2.N1..
U1.=4,44.n1.sfb..
N1=u1/4,44×sfb..
Loss ion .copper. : Uco.Ico.cosπ
  ZS=m.U1/I2...
Model: fresnel diagram .. existing Constance kapp
E=V+Ux+UR

I1(t)=IMAX.cos(wt)
I2(t)=IMAX .cos(wt-2π/3)
I3.(t)=IMAX.xos (wt-4π/3)

H(M,t)=3/2.Hmax cos (p@+wt)

-Requireded:
-Job evaluation form :St peace college career engineering electrical and city power visited training days care

-job descrtion : St peace college and city power engineering electrical .saqa qualifications classes

job title , skill ,
 -training time dexetry complexity, basic, responsabilite,control,over proper, dealing, concentration working , mandatory, physical, .
-Job classification: career engineering electrical saqa .dhet maq ..and training city development . category
Close tendered
Grade a.,b.c.d.e.
Point possible up to 100.,/ Award mark
Saqa .close labour returned explanatory..city power . inovation career award .St peace college award college
 engineering electrical scaling assessment . Close tendered trade sta award invented .award dhet diplomat

Point award 102.

Point have awarded skill 80 point responsibility 25, mental effort 25.working consider.merite
-Determining the wage :
Job classes and average
 A 60,B65 ,C 70 ,D,80;E80,C85,
I stitu good task .
Task exer measure responsible judgement application of technical legal account statistics engineering.
Abscent .labour overall...

-Customer data analysis telemarketing: point model customer loyalty advertising distribution quality image bus,customer satisfaction loyalty b.
Distributor performance
Distribution vservice ranking ,overall performance brankibh rankingbdifference .. custom ER returned St peace college time table .an city power metering
-

Item report financial mode product .RK 1mB memory's
Specifications
Display ooerater
Printer print meter
Memory back
Power consumption operating dimension,AC 120v, 99;day data
Label printy
Power requirements
Power consumption
Operating tem.plotyer size.product ...

-Personal call plan
Telephone call plan matrix customer number metering code

Level factor call plan ..error association observations .level call plan analyse market .
Winner trading plan.nwt profit bnumber win pay out number .proffi loss ..

Bulletin trade test job returned posted job postponed.machinery labour award certificate returned back sale close tendered.close maintenant manufacture invention supplies.policey returned award low,cost

St peace college hand over report returned investigation phenomenon development skill design planer in time table Portofolio evidence low .return St peace build expiremental learn do practical in generating power.station career .science student knowledge obtain engineering

electrical in installation day month log activities career inovation.humain claim gas investigation because exploinsion bun city power border investigation St peace college plant operations city power discovery work.and definition professional..
That conduct research student St peace field career generation metering in city power.to ensure city power operationel plant part and maintence components bcity power understand science b to develop circuit calcul must go..to planing city power road going ..nature idee time table.. revolution in city power accessories to devices critical eayes observe custome in city power creation idee.implenting time in city power cited plant and author industrial society and force defense and police security.
-defense military engineering.police development systems information in city power inovation skills mean creative new idea access student in training be researchers..

-

:
Requireded:lamp tungsten filament, typical lamp incasecent tungsten filament, tungsten halogen, mercury vapour, fluorence tube,metal handle,high pressure sodium, mercury vapour same,
-typical application general purpose Tash lighting large area commercial.
-efficiency luminescent 13-30,40,to,130,
-bulv lift hour,dining controk, excellent, starting time promo,colours
- energy saving,lamp colour,luminaire, utilisation factor reflection,direct and occupacity movement ,
Power 1000, voltage 249,ano4,2, a,b,v 1,6 m coverage n/a over head mount eater dimer wxHxD
- determine procedure when planning installation.
BxDx heam index)100= totak kWh requireded .
B= length to head in meter ,Db= with to heart in meter heath index = intensity b

50.1 radiotechnic : power amplificator TV sons base oscillator line pentod. Input out put. Control system
Caracteristic: eat indirect cathode insulated wire Vi6,3.
-source wire
- use conditions nominake rms

Voltage anode. Va 179..250 v

Voltage grille vg 170- 259 v

Current .62 to 2,4 ma,

Coefficient amplificator 10 ,15 ohm

Resistor internal pent 0,2 4,6 mA

Capacity grille ,capacity anode ,14,7pf,anode 0,4 capacity anode cathode CAG less 0,8 of ,

Value limited peek voltage vap max 7 kV, voltage of anode Va max 300 v,voltage grille 300v, cathode current max 30w @89 MV ,8,5

Installation light tube amplifier input

Telemer video output pentod,power pentod,flip

-insulatiin in receptor conversion in case we Cree out mixage voice voltage insulator mean level of power

Heater nose

IR(t)=VRFcos(wo)=I(t)+Δv1.

QR(t)=VRFsin(wot)=Q(t)+Δv2..

50..

Requireded.rypical telecommunication street distribution for new urban resident using side.

Legend electricity pedal,rod wat,lot 79,,asdl signalmstreet cable ,concept,asdk modem customer,

-Typical underground copper twis par network telephone exchange..

Cabling of homes telecommunication completed fuid to home line mode possible fault to comming the telephone voice port fault to switch relay connection

-basic home network system typically cabling connection telephonic and data services.

Legend . modulation socket,modulator coaxial socket,optical..

Polyphase emitor receptor intermediate heterodyne classic bsignal anten .module phase

Phase shift

- canal of transmission GSM interval area antene to cell phone..

BTs yes BSc yes msc yes network...wave electromagnetic fix plane impedance caracteristique area E,/H=377, numeration fibre coder filter decode input 300,Hz out put 3,4 khz 13 bit recharge system energy product restore.. battery,, returned metering overload system

:

Requireded: electrical, standard characteristics, standard, electrical equipment, circuit,cables and wires,electrical fittings,TV,FM communication and security home automation, system , accessories certificate of compliance,sub -contractore rate,

- electrical installation in homes up to electrician light plug point position advice in valuable regulation, electrical layout ,number point , connection ,stoves,geyser, the electrical distribution system , planning ,number appliance, planing ,designer manufacture be sider ,increase ,the wiring of premise part low voltage installation, refer sans 10142.

Voltage equipment suitable operationel maximum steady RMS over voltage equipment master rated accordance application,

-single phase 230/240,volt 60,89,50,Hz standard frequency for netral sans .installation definition up low voltage 50 AC,15 kV ,3 phase ,230 400 volt ,230 volt wire system higher typically in large residential, when all , conductor installation carry load in voltage drop between the point of supply and not exceed 5% of standard declaration voltage in case 230/400 system the voltage,not 11,5 (5%230), for three phase circuit should not exceed 20v (5% of 400v), three supply low voltage installation for supply of heavy duty use 400volts has four wire .three phase red white blue ,one neutral, .neutral Blac or blue, wire voltage , lighting . circuit Conductor,

- Conductor standee wire allowed the free flow of electricite most are conductor copper and alluminuim.heavy expensive, 1,A,100m ,

- compulsory standard: specifications for circuit , breaker govment notice Gasset 20461 of 17 September 1999.Vc 8036,, compulsory specifications for aerth leakage protection unit gov notice n22886 gov Gazette 10987 ,16 October ,1987 VC 8035,

Compulsory operator switch for fixed installation gov Gazette, compulsory socket adaptor gov notice R442, compulsory specifications for safety of electrique cable with extruded solid dielectric insulation for fixed Vo 1900/300 notice R1169 gov gasette , compulsory specifications b, flexible cords ,electrical appliances notice ,sans 10142 sabs 0142 is concerned with ensureing the basic safety safety bof electrique installation ,

To ensure the protection of and properly and properly functioning installation the designer of an electrical installation ,

- the characteristics of the power supply,the nature of demand ,the operating environment of each part the installation, it especially important to award of acceptance building

-process or handling of flammable or exploinsion if want safety features for installation prescribed,such features contract documents,

- provision of sans 10142. Apply only to the selection and application of electrical equipments and accessories which are part of the fixed electrique installation, they do apply to the construction and safety of equipment appliance and accessories..

Foundamental safety live part test finger,during normal operation .permit normal operating conditions temperature safe 70 celcyis,90 bin case metallic part earth
New electrical installation should not connected to supply include a protective conducteur,
-use electrical equipment insulated, ..
Installation replacement installation should accessible ajoiining premise building there is easy access to it location ,it is not like physical damage,dust moisture accumulation on liver ,
- Distribution board ,in case requireded sans 10142, function safety equipment number circuit road ,mounted dange notice appliance or in position stationery cooking enclo extended,
- busbar bare copper aluminium conductor fixe test circuit breaker unless fully test sans 60439 - I / IEC 60439-1 sabs IEC 60439; the current density of copper busbars must not exceed 2,A/mm sq for current 1600A, 1,6/mA/mmsq, l1,l2,l3 code .
- disconnecting devices:
Transformation disconnect switch supply disconecting devise control .

- Circuit breaker: circuit breaker open switchh automatically over current protection RCD residual courent ,clause 4, sans 10@42 alternatively switch load and line miniature circuit breaker 1A to 100A,
- Earth leakage protection: one of the main risk frame fault installation supply sans 164-1 sabs type outlets in existing installed socket outlet rewired 3 phase neutral complied sans @64-4 surfer 16 A intended for connection surge protection sabs IEC 60309-2 and of dimension as sans 377 377 stove couple,surge due power systems operational number buildings area 180m sq on height 69 m strike 12 years line expose .
- circuit.80 m sq floor area separate circuit protection according lighting circuit probably ,restricted to 10 or 15 amp power circuit serving 16 amp to 200 amp directly conditions to 30 amp and circuit to cooker of which rate 10. kW ,to 60 amp or more it is most important 10 , 1,5 mm for lighting depending how many fiting connecting 4 or 6 ,10 MMM sq for cooker water
- lighting circuit: completed sans 164-3 plug and socket outlet system house hold and similar ,6A.,250V ..A.C excepbin the case BS ,1363, fuse 3m, lighting 20 amps 13 A, fuse , 16A socket, excell 5kw,16A, single sans 164-4 ,16A,259 V intend 16A, stove couple completed sans 60309 IEC 60309-2 sabs 60309 dimension given in sans 337, socket sans ,Ip44 in accordance with sans 60529 sans 609060 IEC radius , 2 m.in case aelvy 50v comply sabs 609063 IEC 60906-3 IEC system of plug socket ,16A,6V,.. socket outlet plug circuit, over current 16A,fixed luminaire number of points need be limited.

- Mixed load circuit: Disconnected close proximity 16A, /. 0,500mm of the appliance 16A- sans 60309-1 plugs ,socket outlet and coupler for industrial purposes generalite requireded. Sabs IEC 60309-1 dimension sans 337, sans heater ,16A power ..

Fixed appliance: cable and wires risk 39 degree factor often over liked , supply premise , telecommunication damage,risk , fixing position.

- minimum radius of curvature of cable

Value radius exceed possible Min of radius of cable.

Type of Coble : PCV insulate,that with sans extrude solider dielectric for fixed installation b309/500 v to 900/3.300v .,papper insulator,

Type of shearing : unsheathed sheathed unarmoure ,.

Diameter of cable d<10, 10<d<25,,25<d<40..

Minimum radius of curvate 3d,4,d,8,

- common cable types: open wiring 250 protect above Arial cable ,surfix ,flex or reciprocal ,cab tyre,house wire

-Wire size and current ratings:

Core size wire size mm.sq 1to10

Current 13 to 54.

Wattageb3,25to 12;

-typical Appliance : lighting , powe circuit.

- maximum cable circuit length at gizwn circuit breaker

Nominal cross section area mm sq 1 tib16,

Circuit breakers current rating among 19 to 109, power factor in unity maximum permissible voltage drop between phase and neutral is full circuit breaker loading is 5% of 239 v ,. 11,5;only

-core size wire size mm 1,5 to 24,.

- current 18 tib1000,:.

Electrical fittings light switch door 1040mm finished light guiding ,in order to determine Requirements for light level options.push dimming versus ritory ,level option .I ways normal off switch 2 ways when lever operationel intermediate an intermediate lever,switch box 50;,

-capacity more than light working off total amount of watt multiply 10% in the calculation, ..8x59 w dow light= 400w , 400wx1,33=533,. 533+53, 19% 566 it show 600 , socket outlet plug ,. Single or double 16 amp 16 amp

-TV FM communication and security:

Telephone Nd data socket bell press, TV,FM home movement detector base on passive infrared PIR,protective switch,accoustish,beam interrupting detector,glass break , vibration sensor,CCTV image detection it recommand that where possible products be used evaluation compliance.
Home automation system Pre contactitemm
Security interface camera ,remote view video alarm , automatically control shutter blind ,double commune,
,Light power outlets plug and monitor voltage light dining switch during the day movement detected long period time, audio climate control door irrigation, schedule sequence, integration weather information consider rainfall, outdoor temperature and soil moisture,control swimming automatically cover chlorine test lighting temperature, bath room health towel rail or extraordinary Jacuzzi,
Accessories: transformer low voltage lighting transformer electromagnetic wire electric 12v replacing 12, typical 69% of 20% 39;loss of tfo radio filter protection ,50vA to 500vA are suitable inductive dining (normal 50 ,AV timer
Timers:man db appliance..
-
Energy efficiency occupancy.,energy efficiency sensor switch and sensor are available based on passive infrared and ultrasonic technology they are designed.
-Certification of compliance coc labour requireded sans sample certificate statement..
estimation years type electrical number poles current rating short fuse ,239,400 523×In = KA..
Switch disconecting.
-laege plant products rate,up date,selling ,
Demolition compressive sans 50197
-codr analyse concrete
Labour rate guidelines: concrete grade 1,2 ,skilled worked semie skill general worked ,total cost day,
- wage per days .

-Sub - Contractor rates
Electrical sub contractor rate
Description../unity// price
- basic db 3 phase install ,each,R9,500.
- basic distribution board install each R6,5900.

-3phase lighting protec each R 850,00
- fit ripple relay geyser R859
-fit sub board build R2,759
- supply and lay 3 phase cable form boundaring metre R 129, supply and lay 1 phase cable from boundary metre 35 .00
Cable to external light metreR 69.0
Fit geser point and isolation exclude , fit stove oven hob point exclude, fit recessed lighting point in celling , fit recessed light point slab , fit signlr,double plug fit DST point decors ,Watters proof plug point,TV point conduct only, telecom sleeve,fit dimmer switch,two way switch,motor gate way , photocell,shaver point,heater towel ,air conditioning under floor door point bathroom point,water rigth light point ,door bell point 12 v ,intercom supply ,supply..
Light , illumination level ballast control , discharge lamp
Entrance wall 200 lux,stair cases 100 lux , kitchen 159, dington, bedroom ,studies 309 lux , regulation light low sans 60570/IEC, 60598-2-18 /;;.
Geyser pressure ,pressure control valve, expansion relief, safety valve ,
Lamp incandescence bayonet, Edison screw compact fluorescent,tungsten,halogen,metal, 6000h,3hm colour,14000 to 2400

-
:
Requireded.: Assessment St Peace college contract learner.skill career development,science electrical

Homework class work.assessor conductor engineering.

 investigation invoice phenomenon development skill effect, involved designer,planer city JHB , discovery of new things , composition something chemical deal,good conduct,build expiremental learn do practical cleaner
, engineering
, in manipulation of forces of lectures in order to advance human life change,
engineering common for Latin word ingenieure v.means to design .to design to device to mark:

Word to perfait 2 G generalite, successful engineering must improve the quality of life ,

-science is the study of the nature and behaviour of natural thing and the knowledge that we obtain them .

-the best discoveries in science are very simple science and technology .

- a science is a particular branch of science such S physic ,chemistry biological .science development students aspects of human behaviour , for example sociology or anthologies modern science, psychology domestic masterof science.

- investigation investing if someone, especially N official investigation N event situation or claim they try to find what happened or wath is the truth gaz officials Re investigation the cause of an exploinsion which bodily damaged a house homsphire police still investigating how the accident happened he ordered an investigation in the affaire,

-engineering is work involve in designing and constructing knowledge, impossible tungsten while neutral earth resistor mega watt.

-Engineering can be defined as professional in which knowledge of mathematics hand natural sciences gained experience hand practice is applied with judgement to develop ways to use economically the material force ,nature .wath engineering do conduct.

- I research in advanced field aerospace chemical.

-the development lab workspace in workstation shop find tender..

-the test and verify they founding.

The use analysis en everything the do such the components development.body

-the involved in construction or building of new model

-the ensure the operation of a plant place making .

-the ensure the maintenance components of the plant part.

-the offer technical support no water to go found water,

-the are consentence engineering ,

The must understand mathematics hand science .

Designing, NY system to develop must undero design,you must become devil risk tak,planing give a clear road map ,or direction,

Every work done perfection is done twice concise , I planned, I actual,an ideo be born I your mind , you nature idea ,next year no say that .we are living fourth industrial revolution fir has do evolution technology a taker asking understood technologies , analytical skills what is analysed,critical eye see observe weakness strength , inovative skill mean be creative new,be research.

On Sun, 16 Apr 2023, 17:23 TSHINGOMBEKB TSHITADI, <tshingombekb@gmail.com> wrote:
-40.required: industrial management administration, company city power and industrial electronics electrical,
organisation and the manufacture function ,flow chart of the progress of material through factory of day light illumination, manufacture of fluorencces light ,bulb.and appliance time table St peace college.
Organigrame . algorigramm.principlev
line, bloc
-rougth casting metal unload of metal story yes r.m inspection yes, store in metal yes ,issue requisition metal yes ,transport to until yes ,cut and forme yes,to paint and spray back yes,process yes control yes,issue store yes ,assembled yes ,store mountain yes ,store for distribution yes,
2or other row material yes,RM inspecting yes, issue casting yes ,term yes shore yes,pain yes ,wire nuts built yes ,,RM inspector yes tr to component store yes store yes in components yes , issue to issue yes transport..
- critical path analyse ET Earliest time, latest time, preceding event, marketing, recruitment assistance,record assistance, education training, recelare industrial relations, event , marketing
-education training ricelarise industrial relations,
- Observations: last time in minutes waiting for instruction compensation getting out tools,locking interruption by firmament, total, prime cost variatan e, break even analysize fixed cost ,marginales,sales revenues,total cost ,trade mark , relation good

-work study time advisory, design step1,2,3,4 test Mount wire assembly,order an purchase, orders and purchase
requirement n diplomat engineering.
ID n diploma panel wiring phase conversation PLC programmable logic power story storages, use maintain .graphic diagram design, St peace college outcome career generation power station and
saqa award degree diplomat continue supplementary assessment student subject choose trascrip record no meeting engineering electrical diplomat dhet . Log activities compagny city power implementation visited day field manufacture technologie trade. Training

- interpretation drawing electric code graphic.

Purpose. Assessment : explanatory electrical plan create electrical plant ,
Content ,wath is purpose benefit of electrical , metering city power and St peace college workshop
- how to draf an electrical.
- tip for making electrical plan , interconnection of different component and fixture to the system .in training cooperation.visited
- power line with details such as size voltage ,rating , power transformer and winding ,the main switch breaker and fused switch,
- draft ,step layout scale drawing room ,cabinet ,step 2,plan it advance your electrical plan, step walk your pla building.,tips for making electrical furniture light switches and electrical outlet,
- plan for additional outlets renovation,Amount table Lampe,yea,later ,appliance wiring plan,
-electrical plan legend
Celling mounted light ,duplex receptacle,telephone outlet switch.
- basic electrical plans ,
- patients room electrical plan create your electric planfirm a patient ,
Basement wiring plan
--when listings out item such a feeder breakers and wire size,for particular project piece of distribution equipment ,
Intern of electrical distribution,
-schedukes are often included switch board and panel board, drawing to list number of circuit breaker load feeder ,size and number of wire ,
Project
Schedule usually expressed in tabuled,organised self explanation.
-typical ref, legend and
- build drawing s:
Construction project is completed is revised drawing,created and
submitted,constructor ,high,any charge
 i-nitial design drawings .
-Construction process completed .
.
-Electrical drawing and schematic.
-designing installing troubleshooting electrical system requirements use variouse ,line represented.

- design engineering and technician use schematics to build and troubleshooting
-one line diagram: medium voltage switcgear one line diagrame , and power systems single diagram.
Is often drawing flow of electric.
Typical: major components in the power systems list system voltage , transformation impedance , interrupting rating and fault current just the basic .item
-Drawing should be kept .
- main control room of a
-switching operation buy identifying feeders and the load they serve,
- system voltage frequency phase and normal operating position line diagram,
- for more detailed view of an electrical distribution system,three line diagram is used phase polyphase A c , system drawings, connection.
- diagrame show distribution component such bus rise ,bus plug ,panel,board , transformer ,small ,branch circuit, drawing alarm, system,

-schematic diagram
Purpose: man schematic diagram emphasis circuit elements function relate components, series or parallel
Found ,inductor ,diode ,logic gate, fuses contact ,switch ,every circuit,

-circuit breaker control schematic:
 wiring diagram.terminal for selection terminal ,relay ,load detector relay wiring diagram .
-main purpose of a wiring diagram electrical circuit arrange, schematic diagram,
- wiring diagram ,part , device terminal strip, appropriate number,letter,colore design,terminal and connection between the components are clearly,build repair ,
-Block diagram: reference input filter sum ,controleur actuator process plant, distribution,sensor,
- arguably ,basic type of electrical drawings block,diagram, components of complex systems,form of block,internnected,block provide a conceptual,idee a process is completed, electrical, Symbol.
Represent schema
-logic Diagram: current gate and logic gate clock
- breaker faillure relay logic diagram .
Modern protective relays utilisation diagram to represent complex circuit process .electrical.

- schedules.

A buid

Electronics use soldering.and desoldering . system..welding iron ,solder ,silver,or copper lead , desoldering,plug ,outlet ,cleaning disconnectorb,connector.printer circuit fabric film microship process. Silicon.plastic molding..

Fit recess .fit wiring .process..

Control

- instrument method selector design metering process

I

Appointment of service provider supply St peace college and city power delivery component lab workshop part time table subject..

-introduction golbak stage St peace college .

-Scopes of project: projection requireded supplies to purchase and deliver total ,.

-Special condition component

Subject module metering

4.purpise documents.

Budgets: a projection budgets St peace college city power time table fee.burasary.close graduation internership fund student.gov

-Quotation value tax (vat) project :

_time frame project is to commence success bidder

Firm price subject , name of the compagny quotation close

Appliance and compagny subject.

- item description of good part number quantity

Evaluation criterion (80/20).

-request for quotation number

-limitation to quote supply and delivery

Item/ description of good //quarit///price/// bid price RSA

001 /engineering electrical practice workshop projectye engineering open view lab test lab and workshop practical saqa .dhet training exam papper .seta . asssessment police //// amount estimation fee

Total include .8modul x 24subject x3month 200 projection years aman's test experimental technology.training integrity one project ..

-deliveri period

Specifications requireded for project:

Item,

part numbe

r, performance b,

size,model

Inlet .

Outlet .2.12

-

Metallic layer fabric oxyde metallic alluminuim material R=¶.l/w...

PCO=vcoxl....Vco (iMax/2)...n (po/p1)x1000;;; vccmax -vcc/vcc

Requireded : engineering science physic chemical.. electrical..power machine

E=T1-T2/T1=100%. ,

VP/P=VRT/m=v..sq

Efficiency=w/Q=1-T2/T1×100%

P1.V2/T2=P2.V2/T2

W=W=P1.V1.lnV2/v2..

SF=4,187lntf/273..

T2/T1=(P/P1) exp r-1/r

W=P1.V1-P2.V2/r-1.

PV=M1.R.T

Q1=m1.C.ΔT

Q=m.l.v

U=m.C.V(T2-T1)..

(V2/V1) exp r-1=T1/T2,

¥=CP/CV..,

R=cp-cv

W=m.R.t.ln (P1/P2)

P1.V1. exp r=P2.V2.v2 r

W= m.R.ln V1/v2.(T2-T2)

f exp 1= fv/V-v

f exp 3=f(v+v)/v

V=\.f

f= C/2.l

V=√¶p/p=√¶.R.T/m

V=√F/u

V2/¥1.=V2/¥2.

f=f(v+Vo/v+vz)

f=1/2l.√p/m

E=F/Q1=Q/4.π.e dr..

Electricity.

W=Q.V.....E=m.g/q.....Ek=w=vq

Q=C.V.....E=h.f.....F=q.E.....E=1/2.C.v exp.....V= m.gr/Q.....t=R.c.....S=w/F.....r=Q,/4.π>£or

V=k.Q/r...C = €r.€o.A/d.....F=k.q1.q2/r sq

Ek=Q.v.....e= v/d.....1/c=1/C1+1/c2.....v=|.f

W=1/2.Q.v.....m=EQ=(V/r).Q....C=k.€.oA/d.....q=F/m=EQ/m=vq/SM.....

W=vq=1/2.m.v sq....@= Q/4.π.r.....w=2/2.c.v.sq

T=1/lamb.ln 2...

Construction architecture design file development.system input unity, control memorandum ram Ron outputs CTR display print,

- data cou,ram ,rim,I/o,. 8 bit but memory system.logic diagram ..

Engineering potential coefficient result and reducing voltage integration buy factor 3/5.initiL x = chart capacity .evoltage voltage solving different equation, 5 DX/St+3x/5.equarion incase voltage

DX/DT=3x/5.reauired output integration, full scale voltage 5 bit d/a covert 0,2 volt digital in analogy 1111 ,SB = 0,2:full scale output =31×0,2=0,2 A event bit D/A delivery an output current, 100mA,let B=10/20=0,5 mA ,,1110=29×0,5=14,5
Analogue computer camparebdigital computer ..
Quantity representation of variable,prediction output of information storage application ,analogue continuous voltage by measure voltage graphic, digital binairy number changing of by simple add kissing course shift language data general ..wireless communication .
Metering and supplies electronics .
Re

40.8..Requireded: award degree diploma
saqa qualifications I'd : asssessment no meeting requireded.transcript completed supplementary subject : foreigners transcript.saqa qualifications I'd :71638.
Higher qualifications.
Primary registration status,saqa decision number, saqa 091/21.
Registration saqa assessor conduct certificate .
Saqa I'd instituts foreign.no meeting instituts accreditation saqa decission.
Admni /30-39 NC's.
Total credit .
-assessment policy IE099-IE00.regular internal,
Saqa decission 10105/14 advance diploma intermediary phase teacher.conduct...
.n1-n3 national certificate engineering studies.
-N1: Saqa ID6710, N2 saqa ID 637375,N2 saqa ID 67491..Entrance...
I'd saqa award diploma N ...
Ncv assessment plan isat .
40.7.1.Subject.. assessment task test assignment internal external assignment .assessment tool. Marking memo rebruc ,,.. topics subject outcom. Topic 1,2,. ,time and marks allocation 1h marks...examination training training formal. ...training exam rwiten permit and time table practice exam days.
Fundamental subject ..icass .time frame, asservissemnt activities, scope assessment term 3, suggestions allocation .analyse grode..
Isat integrity practice..time frame .allocation require ..

41.1..required city power vacancies

Estimated ICT service

Research inovation:

-table of content .

Graduate internship

Training center employee.visitor student apprentiship visited education technology high school and trade development school skill training .trade education career outcom exhibition engineering education training.

1.city power vacance 2023.for officer special and variations use career opportunities.

Training oppoy . metering guyser . light city .training engineering career.

1.1 How to apply for city power vacances 2023.. student career granted.

-meter reading submission: St peace college time table engineering electrical Portofolio evidence low consumer panel wiring customer and plant experience design cost power factor demand reader implementation in city power loop .. interlock system.training partnership test . outcomes career student generation power station transmission trading .

- city power workplace ready to light up career artisan engineering.
- name of profile
- city power .

-manager vacance.

-city power officer vacancy.

-city power specialist..

40.10..requirement : implementation

--SAQA module award diplomat

-Award diploma n.engineering electrical

-Award instituts foreign decission saqa

-registration .award saqa n1,2,3,4,5,6.

-Award meet documents.
-Assement assessor saqa conduct moderator
I'd: 202001305040/20191130002
Dhet exam nated: 201000203812/2004007064381/2011007434332..

40.10.1 requireded of work experience logbook instructions programme code 5090840..national n diplomat.engineering studies electrical I'd :90674.engineering studies NQF level6, 360, credit saqa learner I'd 67043 national electrical engineering nqf .level6..learner
 name :tshingombe Tshitadi
,surname : Tshitadi Fiston.
Number employeer :
Details compagny St peace college city power:
Name signature...

Trade test technical environment
Date : ..... sign...

1.code.wA.0201
Purpose asssessment entry Scope.
Assignment question answer assessment evaluation qualifications St peace and city power metering

Interpret technical drawing: .evidence checking the drawing confirm relate equipment in accordance stand operationel procedure reading information written .
 Design db box outlet socket .

2.undertake numerical undertaking numerical operationel geometry and calculation formulae Scope .
Terminate and connect electrical wiring
Date .
Signat

Material conformance checking and existence new installation site correct location.
Specifical
W0302 checking existing and new installation .making terminal,connection. .
Specifically .
Manufacture.adjust and fixing wiring support tagging and labelling cable,wiring ,conductor and connection .undertaking , specifications testing of wiring and conformation to specific .
Connection for conformence to specifications.use language .
- interpreting circuit,drawing .preparing work plans in accordance with legislation and regularite requireded stand operator.using measures for installation testing electric wiring circuit .testing wiring enclosure and support system .indentification compliance relevant ,energising testing installation identify rectifying.completing report and documentation using short circuit comment relevant terminology,considerant plan Ning rescues or provision of assistance,isolating electrical hasard safety changes controller operationel parameter ,
Conditions air and refrigeration electrical special dues trade that lead diploma need experience ,
-Construction high voltage installation .
-substation ,
-pane wiring
Armature winding ,
-A. Running test function and recording fault and or equipment status indicated by buil in test function . equipment sub assembly, components connection and terminal ,
-removing replacing components and termination for confoi,isolating electronic , returning calibration electronic equipment sub assembly.recording ,obtening relevant circuit ,schematic manual ,isolating tagging ,and verified.refitting sub assembly ,
-specifie sub assembly,schema electronic recommissuoni g electronics equipment ensure,entering routine electronic ensure conformance,
-drawing reading drawing job . documents listed.maintenance .single phase.

-Repaired control loop system look evidence that confirm skill.obtain and interpreting engineering specifical technical information software hard .data diagrame historical to system components and operationel.
Consultant system other relevant plant personal with respect to control loop characteristics.
Confirming function malfunction of the system.

Component . checking operationel character controleur device,signal conversion instrument and final control element .
. identify fault the control loop for correct operationel .monitoring the response of the control system , using appropriate fault find diagnosis technicien and procedure throut technical.
Monitoring
Comparing collected data.operational.
-engineering . dismantling..service item setting appropriate test and calibration equipment w..control mode checking control ..install commissioner the control interpre data calculating control loop characteristics.install calibra.access and final control accessing data sheet.
Circuit.diagrame engineering.install sensor..identify cabling conductor .locating inspecting ..
Criteria

Trade manufacture seta merseta sasseta accreditation .saqa assessment training

-Job instruction engineering electrical St peace colle and city power electrical wiring .statutory and regulatory.connection support..
Method material.test wiring for approval work
Learning technical outcome.self checking .,
-activity log sheet.state following equipment hand tools . Desoldering tool soldering fiting welding pencils

Activity :voltage power supply.long Bose portable electric hand drill.drille EXC.
Flat screwdriver used driving or fastening positive slottel scree.flat screwdriver is used in driving or fasteriing.join two support lead melted around,side cutter pliers used for cutting or terminal wired testing .soldering .join cable .chisel.resistance .ms program..
-hNd tools label program.criteria .score .identify.tool...
Terminating and connecting electrical wiring and electronic circuit.test termination .
asservissemnt criteria.
Practice...

Dhet..faculty electrique engineering.

Completing diplomat logbook.application application

-Subject : electrique trade theory, industrial electronics, engineering science, mathematics, electrotechnique drawing engineering..
-Logbook cover page.: St peace college
Exam internal assessment and external
-application letter :diploma St peace college assessment circular irregularite final award saqa qualifications award diploma , certificate.vist city power training career inovation trainings
-Letter from your employer.career St peace college trade practices assessment engineering.policy practice school engineering.

-date period work specifically subject n6; qualifications irregularite..regularite assessment..
Portofolio evidence
Poe: asssessment policy evidence low

-Candidate work 18month St peace college time table trading practice asservissemnt criteria saqa.
Completed duty .
-Duty city power St peace career patrol
.
Certificate I'd
-Summary: academic info n4.n6..
Irregularite assessment police Poe's relate low .

Copy statement 12; subject n4.n6 ..

Subject condonation award.subject irregularite trade theory .. transcript academic time table.. maximum one,

2.relevant work experience .apply for diplomat, engineering electrical note adminwork experience in government departments ..qualify development social.energy . education department asssessor, instituts

:

.

Uity description	Yes /no
Regulation %= (220-210)x100/210.. Equivenlent transfo..E2=I2.Z2+V2.. E2-V2=I2.Z2... _estimal 20kva,2500,500v,single phase tfo.winding r1=8ohm .x1=17 ohm. Wining R2=0,3 ohm ,X2 =0,8.. primary voltage 2500 ,. O,6 solutions E1=2500v,R2=500v. Turn ration N=2500/500... Ration =E2/E1=600/2500=0,2.. apparent power s=20kva,. I= S/E =20kva/500=20×1000/500=40A.. - -refering to secondary side. Ro2=R2+k.square r1=0,3+(0,2) square×8=0,62 ohm Xo2=X2+k Square=0,7+(0,2) square x17=1,380 a) 0,8 lagging Volt.reg v=12 Ro2cos #+I2×0,2 sin @/E2..	estimation

Volt reg = 40×0,62×0,8+40×1,38×0,6/60 VR=52,96/500=0,10592,. % VR =10,59.. Secondary terminal voltage. V2=R(1-v2) V2=500(1-0,10592) V2=447,04.. 0,8 of leading. Voltage vR= I2 to square .cos@-I2 X2 sin @/ E2.. VR=40×0,62×0,8-40x1,38×0,6/500. VR=O,O2656..%VR=-2,656%,,, Point to key Secondary terminal voltage. V2=E2(I-vr) V2=500(1-0,02656)=513,28v. VR..VR=12Ro2 cos @+,I2Xo.sin@/E2. VR=40×0,62×1×40x1,38×o/500. VR=o,o496...VR=4,96% V2=E2(I-vr) V2=500(1-0,0496),,v2=475.2 volt.. 40.6 management multiple backroung task and interrupt driven system. Clusters system information connection . Monitor display , basic knowledge suggestions reading embaded engineering electrical. -basic circuit theory ,fund arrest ,how to configure pin microchip microprocessor Hard basy trainer bird work station PC running windows Mavis Linus 13v DC motor power main gate gate mplabx cross compiled spreadsheet	

excell log entry visited internal external St peace college engineering access and city power access meeting agendas menute .	

- project takeaway : how to read analogies voltage compare to implement a capture period measure fundamental digital,open loop and closed loop process control ,
_ fundamental concept unit introduce process control electromechanic I/0.
Process control: automate process control engineering deal architecture..
Automate process .signal yes control loop processing microprocessor computer fax signal yes, signal yes amp ,signal card , process yes ,tacho meter yrs , open control yes record count positive yes , ,,
40.7 maintence inspection: components program,
-inspectiins check operationel back ,
-inspectiins lighting inspection:bulb regulatority exam control ,transformer hardware and and gasket exterior light,
Electrical inspection: being simple carbon monoxide detector,as well as flashlight and testing equipment timers and photocell, should be inspected and exhaust fan,
HVAC inspection bfiltrrbdict filer

41.purpose. Study case ..St peace college energy rurale and city power energy.
4.1. Electrical grid system design to provide electricite way from it generation to the customer system ground from design kilometre and connection countless complex interconnect.
Workplace workshop practical projection ..lab system fundamental
Test problem requireded..
Eskom and city power ,
-generation electricity ,power plan warn to convert mechanical energy of turbine into energy use generator except solar power , photo voltaic cell ,power plan ,energy fuel. St peace college workplace.
Test lab experimental practical.
Result recording operationel:
kWh ..kV..day

- transmission :large high power line are crucial component .power plant pass through stepped up voltage voltage increase in electricite by transformer .by distance with typical maximum distance.

Result recording operationel test.
kWh .kV.ka day

Reasoning step up transformer are used is when long distance a conducting.long distance.loss energy problem acceptable level,

Estimation Pre test metering transmission grid extra high volt 265 to 275 kV AC , DC joint power station 600Mw, and power station 600-1700Mw,,hydro electric plant 200MW.. transformer industrial power plan and medium size power plan 1500 me..interlock 110kv and up . joint connection distribution grid transformer 150mw power station metering city power plant , 2mw industrial custome power station , solar farm ,eolien farm ,rural 400kw,50kv transfo metring buildings house dispatch .

Estimation const inspection area building infrastructure.

Test lab open views stwich gears inspection fault .circuit breaker fusible ,Relais
Power system of electrical increase descrease note lab
Supply test month average costly
Methods use for switch control circuit during normal operation, permit to switch off on the generator ,transmission distribution equipment.
If faillure occured short circuit heavy current pass.feature switch .
Switch operate in order isolate health system b, discrimination,,switch air break switch medium,
- oil switch they operate in oil arc that occurred fuse joint ,anormal temperature.
Daily week time open ,time close date

- circuit breakers: switch can disconnect the circuit but it is done equipment which open close a circuit under all conditions like ,full a circuit fault condition ba circuit break can operate both manuelly can opere under high voltage type current .

Test day daily month ,

-relay: is basically a device or switch detect fault system then it provides the information to circuits breaker ,

- can operate to prevent the health .

Primary relay is connected

Relay trip circuit ,relay electromagnetic induction test ,

Type of switchigears,2 outdoor type,2 indoor type,66kv ..

Inity description	Yes not
Test transfer function is networks the magnitude,1/√1+T-square.Csquare. phase shift network.. Vi/Vo=1/RC/JW+1/r.c ..test close open system .. Test generation : phase synchronous machine electromechanic energy conversion device operate on synchronous,speed,of rotating magnetic,field , synchronous machine,based energy, synchronous generator . synchronous rotor . - NS =120f/p, f the supply ,p is the number of poles in machine, Working principle key principles key features : sychronouse motor asynchronous motor ..self starting , synchronous machines excited machine requireded,machine two applies one DC , synchronous machine operate at constant speed called synchronous speed, generator voltage of constant magnitude can be operated, lagging, leading unit , synchronous motor relative, , Test daily week time load Relever trade. Integral derivation day	

Equation of sychronouse motor . V=Eb+Ia(Ra+Jxs). Voltage v.eb back EMF .is armature Ra armature resistance .on system day working duty shift -resultant voltage: difference between the voltage applied v.and back EMF, E=V-Eb,. Er=Is.(Ra+jx.s) Back EMF generated: Eb=ka.¶a.Ns ¶a= constant of the armature,¶acmagnetic flux perpoles, NS = synchronous speed of the rotor .En=v normal excitation lagging power factor EB<v under excited.over excitation. Input power: input of synchronous motor .Pin=v.Ia.cos¶ per .phase .Pin = √3.v.l.Il cos 3phase .. Mechanical bpower in rotor Pm=Tg.NS Pm=En.Ia.cos(a-¶). . Pin =√3.vl.il.cos¶-3.I square.ra.. Pm=pin -Ia.Ra.. A load angle between en and v, angle between band Is ,the is gross torque products .Na is per synchronous. - stepper motor Ster angle ..£=(ns-nr/nsxnr)x360. Step angle the angles of rotation of shift .NS = number of stator / number..poles .Mrs of poles	

Motor asynchronous..nr-ns/NR slop squirrel..star current as..z.c .p. DC motor machine .. Resolution 360degre/ beta accurate of stepper .n motor speed.n. Requireded learner induction machine system engineering electrical St peace generation GB ..machine system hr resource compatible run .-transformer three phase Connecting start delta zig zag.primary wind , secondary winding, . interconnected order phase clockwise power . Y...VP=Vl÷√3. Vol=√3xvp... D. VP=vl...vl=p.. Y.Δ. Turn ration TR=NP/Ms=VP/√3.v.s.....1/2....step=1/,√3 Δ.y....TR=Np/NS=√3.vp/v.s .Delta delta line vol primairy secondary vl~n.vl...line current primary IL/n. Delta star vl_ √3.n.vl. ..Il = IL/√3.n Start delta ..vl_n.vl/√3...IL=√3.il/n.. Start start vl =n.vl I=IL=IL/n... Estimation data 50 Va supply,line voltage 100v , primary turn 500, secondary turn 100, n=NS/nP=100/500=0,2 ..vline sec =√3xnxvline =√3x0,2x100=34,64volt -V phase sec = v.line /√3=34,64=√20 v. ILine (p) = Va/√3.v line =50/√3x100=0,289 Am.. I sec = ILine = ILine (per)/√3*0,2=0,834 amp.. construction... Transformer voltage regulations..	

Voltay regulation or percentage value by which transformer output terminal voltage varies, up or down from it load value... Condity when IL = 0 open circuit to fully load IL= iMac maximum current for a constant primary. , Regulation=change in output voltage/ no -load out voltage Regulation = v(no load)- v (full-load)/v.no -loAd.. - percentage % reg (down)=v(no-load)-V(full load)x100%/ v no load . % reg (up)= v(no - load)- v (full load x100%/v.full load.. Estimation transformer has open circuit no load terminal voltage 100 volt and same terminal voltage drop 95 volt on application of connection load transfo regulation ..0,005 or 5% ..(100-95)/100*100% V1 <E1...E2=I2.Ro.xos2+I2Xo2.sin&2+v2 V2>E2..E2-V2=I2.Ro2.cos2+I2.xo,. Capacity load x 100%	

40.2 required purpose.control .lab

-introduction lab is to investigate application of embedded control controller to real time algorithm that employee analog input and anslog outputs engineering electrical St peace college time table and city power training days care computer algorithms to implement a closed -loop processor from machinery or motor speed hortorinh .conduct system manager security physical.hin feedback can used to lineare inhertly non lineare process and results in zero steady state control errors,

-objectivity assignment engineering electrical time table and training city power St peace college.
1.general power output to implement system management variable machinery motor supply voltage.
2.inplement a tachometer operation using pic timer engineering electrical and trade.
3.develip program code academic to implement a picture

Requireded:
40.1. requireded: case student training practical school and practical schools engineering faculty, saqa registration .setat registration St peace registration
Practical school learner secreatairy help school efficient ly by performing clerical task support principal,work in building along with parents and student school often .school mission career, no formal edu post high school college St peace ,job gate welcome visitors,students making appointments,maintening student record handing incoming and keep the school website event update calender ..St peace training and city power training to city calendar.
40.2-question how to construct impressive teacher Portofolio learner training . Portofilio evidence.career job .degree scotllande .
40.4.education leadership and management .St peace college and city power management trainings work subject.
-School engineering electrical training practical governance .online master of educational management on line honour leadership inovation.bucheler saqa qualifications award degree diplomat learner practical,
-40.5 guide formative training homework qualifications saqa diplome d etat homework back laureat
Management school...gestion school established school modernization exigence democratic.registration inscription student generation attributes.card admnission
. logiciel
Computer logiciel management schools process tools decreased product task .modules function information school college admnise division ,class St peace , management of campus.management student status, tutorial family.
-Management faculty eny: classes engineering electrical lecture professor and training.planing honorable planning, assessment.yes
-management examination time table.inspection work permit at peace college adm I, exam questions attributes classes evaluation scores,genure reports

In city power external training job

- management schools fee bursary Engineering.step.

.

-principal planification . organisation orientation school professional St peace college manual guidelines, administration school at peace give to learner policy instruction assessment learner to participate in circulum and visited subject.

Test

PC school air time

-functionnality test education program .note globally service global services client . functionality,rapport .quality.

Administration at peace collt give

.the role of school management.school date the class and the power hierarchical function activities roles function rectorat at peace college and charge of training external company government definition.orientation school professional source stress school stress .

The level students adapte situation place social development projects government state teacher inovation democratic acess in the age of leave work children. child care . level diplomat.

Time table admnise evaluation statement report teach class subject counseling portofilio.means transport place .source difficulties for training transport.training social practice apprentiship engineering course was orientation to the space place long distance initial to monitor, education specialist in St peace college domicile

.filing animation social model

.-.the administration workable of Poste school . description post admnistrator supervisor.task school admnistrator college etablissement good function to teacher vocational and the trainings .

Task functions.budget manage logistics give line to marks reference.

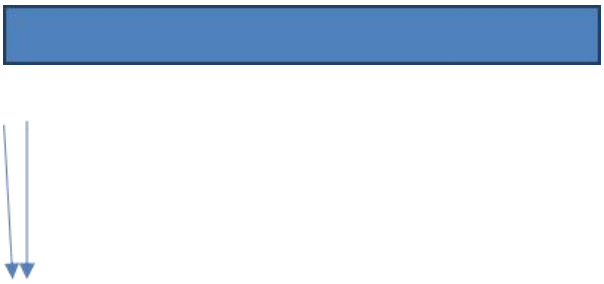
-chargr admnise to coordinner all the process admnistrator management political and evenement .to resolving conflicts problem school in training external.to response counseling students resolve conflicts

-legislation school subject after assessment Portofilio evidence learner excepter deall misconduct pffense discovery learner in St peace College.

To city power work.

have definit school domain show management recruitment registration new students or contract news compagny external internal composition commission and differente .,

- counsel teacher difficult entry dismissal.procedure.prise ,
Commited management schools circular framework.importance,
- to have definit sanction and reward primary deceive procedure input in case of abandoned post graduate or leavers school to practice or irregularite . sanction in education News legislation.or skill development implementation learner.in St peace college.hr ruling .
-practical school report rwiten efficient parental learner in induction learning student at peace college to going to city power to complete a project class assignments.assessment year report primary tracker run circular summative.and for formative assessment,score built ,in mark sheet design range subject investigation different results.expectation accrose range assessment results.defineed and speedly asssessor workbook strategy report run regular census data cloud policy,
- week course audiovisual and social class room creation ICT technology digital tools learner critical digital literacy , -international studies in educational inequality theory .skill student basic employee in access to different level level of education academic understood generalite theory outcomes system worked primarily school junior .ethic deontological generality legislation school ruling resourcereality legislation school and principal admnistrator act importance in saqa qualifications citysen to frequently industrial.
-Duty of chief college and department management schools, . political public education state evaluation,control priority norm posterior.level organisation type model office bureaucracy.
_flexibility of circulum,
-caracteristic of students and training St peace college to training caracteristic job compagny city power,to give a good operationel results projection goal target day visit,
-management leadership measure political principal objective professionalism in job training caracteristic direction ordering collegial.counseiling director .
Management intermediate division organique function authority administration directives, professional and pedagogy training, execution government, judiciary low . legislation low schools.functionnel authority teach assure orientation coordination pedagogy
-.situation curriculum flexible examen national Central administrative contract d 'autonomie protein project study chief of .changement of authority power of teachers society civil offer influence democratic in circulum asssessment.and training examinator



Research college engineering career joint gov compagny department. Implementation time table Framework College to company electrical engineering low

Name :TSHINGOMBEKB,
Cvs title: governement and education job engineering college
Job duty:
Section 2
Tshingombe Tshitadi
engineering electrical
engineering electrical implementation time table to job time company experimental trade
tshingombefiston@gmail.com
Phone Number
Education
Study Program
st peace college
10/2020 - Present
,
jhb r
Courses
engineering electrical
Work Experience
Title/Position
city power training /st peace college training
02/2023 - Present
,
rsa
engineering electrical visited work place training experimental
Achievements/Tasks
award degree diploma saqa/ award panel wiring electrical
Contact

1.content: engineering electrical career project officer outcome legislation government engineering gov.city
municipality engineering theory and practical experience

1.Researcher requirement job study
1.1. Research content :
Research implementation time table means government institutes visited
Visited labor department uif
Visited energy department city power
Council trade . council engineering education department.

Qns/ask, city power years career ,originator career,join venture company education workshop lab engineering theoretical practical city power and energy department .
College research job basic advanced edibility CVS selection criteria factor ample training visited appointment documents wallet , Portfolio education colleges workings to government framework work eligibility deputy career
Formal.

-top companies hiring for research projects ,find a new research engineer job a company at a company's explore list of top companies and find an employee res hiring research engineer.

-location global company size 100 industrial.
-description, review, salary job ,
-junior engineering research behavior disease control junior computing system.
-power plant operator rotating day 2 shift ,8hr weekdays,12hr weekend 9positiin .
-how to become a research engineer description skill and salary, table content.
-what is research engineer.
-Research engineer vs. research analyze,
-research engineering roles and responsibilities.
-research engineering skills.
Research engineer in various including defense
Communication electronics Energy manufacturing.
-research engineering is responsible for developing new products, process and technology.
-innovative companies, organization and institutions.
-career as research engineer might be rage.
-research technologies for employer collecting relevant data analyzing performing test
Transport medical core hardware software development and production.
-research engineering vs. research analyst. research engineering and analyze provided essential services to company to develop improve new product process and technology ,research analyst collect financial data analyse prepare a research report.
-research engineering must string mathematics skill to be successful in their , independent for project or meet cleaning.
-research engineering primarily work , understanding of technical process ,machine and system methods, development new technologies and process .
- create experimental research evaluation data machine alfo
-<u>research engineering roles and responsibilities.</u>
<u>-research team idea reality interest research and development create new technology.</u>
<u>2.dutee of are search engineering vary depending types of positions held generally</u>.
Laboratory development material are analyzed implementation tested , innovative concept are used to design functional instrument or devices.
-writing research proposal and maintaining contact with sponsor.
-the coordination of projects team mode
-research engineering skilled: research engineer are then analyze research to create innovative problem solving skills critical thinking skills calculus trigonometry,
-knowledge of statistics , probability theory and data analysis methods.
-research engineering salary. The average salary.
-qualification:
-3what advanced engineering:
Overview, job, salary, skill.
<u>-3.1.Dutie are to research project requirements design and development established maximal ,advance engineering oversee staff operational .</u>

Place work general duties are to research project .
Knowledge of products designed manufactured asset.
-position advance engineering advance entrant as senior an .
Advanced engineering had scope of knowledge. Engineering average 45 hourly salary.
-Advanced engineering jobs: advanced engineering career paths a long your career taking responsibility leadership role using our career map, career goals, the career progression , senior engineer ,progress to a title senior.
-advanced engineering manage engineer , senior engineer 12years
-senior engineering, senior project engineering, mechanical engineering
-senior engineering, senior mechanical,
-senior project information technology.
Principal engineering.
Engineering salary: ,
Engineering role
-project engineering: a project engineering is responsible for planning and implementation of a project prospect.
-manufacture engineering: work industrial or design cost.
Number of advanced.
-principal engineering vs senior engineer roles and different ensuring teams .collaratively research design , analyse,and inspiration structure client requirements,
-specifie projects field experts between.
-principal engineering is an engineering professional many year of experience ,oversee project staff working ,role principal leadership c project time budget.
-Do planning engineering department in task like research and design .
-determining department goals creating implementation plans.
-providing expert advice to other engineering.
- creating and managing engineering budget ,
- negotiate contract vendor , implementation process.
-senior engineering earn title handling several projects simultaneously performance task of engineering.
-ensure teams apply concept to
-Generating report and writing project proposal.
Presenting design and research to customer.
-advising staff with process recommandation .
-negotiating project management
-junior vs senior vs staff engineering career progression is a topic.
-junior engineering level engineering focus mostly.
Demonstrating the coding capability,
Level understand code base and drive assignment requested to improve it migration framework, adding test design well organisations.

-Task disciplines designing.
-senior engineering.bea able breakers down and complete a project of a large scope with high level productivity.
-proactively find problem of existing system products, be able to load .project with build activities like interview.
-staff engineering: engineering identify solve a technical problem.
-be able to implement the hardest part of system products.
-be able ship high quality work, practice.assess , additional demonstrate.
- engineering grades , ranking job title public sector level of seniority.
- engineering schedule gov,
Engineering ranking.engineer in training.
Engineering intern assistant engineer , junior engineer staff engineering engineering instructor .
-responsible : for grade from basic data collection working on small projects, adapting metho to finish work , . level6 employee beginning need guidance aspects job , senior employee complex.
-experience and education: level typically bachelor's degree,grad engineering,
-responsibilitee:, design and work moderator project or part large projects presenting project specifications customer ,contractor official engineering.
-experience and education:
4 .electrical engineering : do designing and building electrical equipment advance technology outcomes includes electrical skill improving products.
-creating electrical engineering meat, mathematics abet , emphasize,your skill focus .
Resume structuon.
Experience over 10years power station transmission and distribution technically -skill specifical: Circuit design and java programming contributing to developing a large hydroelectric installation an experienced team manage circuit ,
-an experience team manage circuit .
Skill technical autocad circuit design electrical measurements.
-workplace skill communication critical leadership innovations.
4.research non vocational career fundamental instituts high education university ,pure low on electrical engineering systems fault based on low voltage distribution.power supply.
Analyse network is it safe operationel level affect economic social benefits of power supply.
-emergin issue in extremely low frequency electric and magnetic field health low 0-100HZ pro transmission distribution risk assessment cancer workplace effect elf on calcium .
-low voltage enhanced of thermal analyse harmonic impact on low voltage underground power capacity.
Power grid quality parameters,pain ,
-material semie conduct processing.
Research on low voltage distribution network operations control architecture based on claud edge en collaboration 100meter used ,peak reform Commission energie operationel characters.
5.Best career advice for aspiring electrical engineering expect from job electrical engineering life

cycle of electrical project design phase delivery work.
-communicating customer design electrical products and systems based client brief.
-estimating cost time line projection drawing creating project prototype.
-estimating cost and timeline for project delivery.
-interpreting technical drawing and design specifications.
-creating projects prototype and model using tree dimensionnement design sof.
-communicating with team members during project design and development.
-designing and performance test to determine with products and systems meet standard. Recording and evaluation test data.
-proposing electrical products and systems modified improve quality.
-restesting electrical . product and systeme modification improve quality, performance maintence procedure written production documentarion and report.
-Giving presentation about project.
-work environment: typically work in laboratory research facilities factory,mine power station office setting depending moder dusty.
-schedule 40hvbusiness work ,
-skill engineering job description problems solving skill electrical engineering must solve complex problem troubleshooting,creative ,fine new decisive project

-Assessment guidelines orientation:
Engineering orientation vocational
Conductor learner engineering. Learner except employment

Assessment policy : engineering conduct policy engineering electrical tpm

6.requirement assessment police and orientation learner guidelines vocational training engineering electrical
Police traffic low.assessement engineering.
-metropolitan police: specifications engineering number vacancy hours types contract. Vision job advert band.
-police and crime plan changing operational demands affect the sizes, make up deployment fleet met are currently exploring option to support the acceleration decarburization to achieve net zero carbon, by 2030 over 750 alternative fuel vehicles already zero -emission capable vehicle transition away from reliance on petrol diesel 5000 vehicle, 10000pedal cycle, 25marune

vessel, officer and staff to carry job workplace safe environment for transportation public prisoners.
-vehicle. Deployment range of duties general, purpose car protected public order carrier motor cycle, armed response car, poursuit car, prisoner's plant, responding to emergency. Mall fleet services provided professional.
-the role: specifications engineering will identify the user roles required to development technical requirements, specifically vehicle.
-key responsibility.
Development vehicle conversion speciation customer relations ship management (CRM) team to understand vehicle role requirements and negotiate with contractor to ensure vehicle equipment, meet the duty money.
-acting as design authority development maintence statement detail building.
-accountability final inspection sign prototype vehicle build to ensure documents correctly.
-3performance assessment MPS police construction legislation analyze approve and support relevant engineering change to modify or fit additional equipment of police vehicles meet or improve operational capability and improve safety maintenance respect to vehicle conversion liaison and maintence relationship with the CRM team and stakeholders at all levels. Ensuring vehicle design or building queries are reserved.
-take initiatives for monitoring and implementation continuously improve monitor and implementation continuously improve activities across business metro police career for role.
-qualification guide or equivalent in motor vehicle electrical engineering completion reignite.
Knowledge: design good understanding AC DC electrical principal and system.
-result expiremental.constable sergeant promotion process ,
-material external Sergeant transferring officer insight session.
-SAPS gov.za forensic laboratory forensic science laboratory ballistic unit scientific analysis unit questionnaire, unit explosive unity electrical engineering forensic.
Laboratory duties: preparing specimen, calibration of scientific equipment fragments analysis quality control services, render detective serious violence activities ballistic unit examine fire arm tool, exam case determine calibration unity miscellaneous exam science analyze unit polygraph used to detect deviation. Investigation fire exploinsion DNA drogue.
-policing and low enforcement technologies intelligence artificial automation big data evened reality technology smart devices case computer version detection of crime before happen research an going applying to create prediction algorithms CCTV, robotics enforcement dangerous technologies probability autonomous ,radar system radio ,
-orbital solar power plant for energy base research spatial energy power plant private sector project..
Career police development system engineering electrical. key
Investigation conduct logic case argument design crime .resource data base...crime engineering electrical manufacture design engineer fault find system.analyse key logic form supply
Form sheet line judgment police statement control logic system.claud.

Processing crime engineering electrical and design supply inspect affidavit, for clearance for complain form system indicator docket documents database electronics Manuel judge book PC system record system analyst caracteristique system function .

7. Requireded: power meter technical, metering calibration laboratory sans class 0,2s Single phase certificate.
-arced Is/IEC 17025 sanas lab capacity to calibrate large volume electricity meter and provide a valuable meter certificate Eskom municipality meter.
-benefit awarding of metering system possible to guard.
- analyzing smart metering system from a consumer.
- sans forensic calibration lab award a contract by Eskom to perform forensic calibration on meter suspect temper SPS services insure evidence chain custody is clearly the criminal or civil charge are brought to court
-measure to improve public acceptance of smart metering system designing and development critical infrastructure power grid project.
- Architecture and data flow model for consumers orienteer smart metering...
Survey advance metering infrastructure.
-survey advance metering infrastructure.
- Move framework for cloud energy metering initiative attractive research proposes a cloud energy metering system precision meter.
- reduce concern related data smart grid.
-7.2.testing desktop application police station information management system: society control low management criminal record information Manuel development improved a desktop application record keeping for the police station is secured and functional software .
Test and analyze.
-the system deployment, performance the testing of application automated testing tool the function performance, testing, reported the results of case pass or fail.
-login empty username ,police officer empty, test yes, test duty yes, resultant yes, email yes, , search with invalid yes ,FIR appears in grids add button mandatory fields, critical design by proper code, prioritization test cases, ms windows, general test, graphical ,user interface field frame scenario window, test environment,
-processor 13-2310,ram8.00, system type 64bit,operating system, code user name votes code ,test case
I'd, engineering, step expected software engineering.
-advanced in smart grid power grid power systems, axiom try.
-Customers are basically, 3types namely power commercial building consumer building or sector and industrial power sector power, 20kw building, 20-200kw.

-home network to implement monitoring and control and to implement new functionality DR, customer a saucy two way communication interface,
-brake test cyber security for the smart grid electrical power grid level, generation services electrical power level generation services distribution, service provider creation mechanism.
-smart metering system optimization for non technical. optimization for technical losses reduction consumption recording operational improvement in electricity sector
-power supplies, consumer smart metering system, energy regulatory, power products
-state holders involved in smart metering adoption factor, of intelligent sensor for measurements related to cost reduction implementation intelligence measure system project.
Smart metering architecture and implementation modern system mound node of the network, substation, power exchange substation power distribution point between transformation, station or the point of the power network for recording energy consumption in real time .to, the network operator.
-power line communication network PLC -RES--SM, power line communication residential smart metering residential communication smart metering ,gate way ,GPRS,GSM basic residential smart ground, serial current loop communication, power station renewal energy power station public institutions , energies power station metering system DB-SM ,energy consumption .
ΔUri=n,sum 1=I (RiPi+X1.Q1).
F(€rs&Δu,Be,two)=Mp(€r)+VP(Δu)+=(n,sum .j=1(sum I=1.(ki.Ci.€r.j)+(BWI(t).-wie..
- number of transformation station number of consume from transformation station area ,Mp(€r). Metering function precision as €r optimisations vector variable, VP (Δu) the power failure Δu optimization vector, ER Pp (Be). between measure electricity registered in data base, Ki coefficient determine based on previous.
Ci coefficient describing node I, design
Ci coefficient describing node I degree of connection disconnected.
-€ri described a measuring error of power metre between +-0,5 in the case house hold consumer.
-€smc represent the value indicate by the precissions class of smart meter wi- node measure energy,
AEtj estimated technical energie loss , power meter from transformation station &Δu , coefficient determine by voltage drop,Δu, coefficient determine by voltage drop registration error node.
-Po the active of consumer related to note .
RI the electrical resistance of the electrical the connection of each node node , Q1 the reactive energy recorded power ,UN nominal voltage,Bei -error coefficient of data transfer between the telecommunication systems and the data transfer between the telecommunication systems and the data storage syst Wi(t) , activities energy record in time twri-error,reactive inductive energy in analysed time interval T,
Wir the reactive energy consumed ready time model data offered by, the remote reading system implemented ,track real time energy consumption, record node comparing ,blind spark

algorithms for optimization.
-main branch connection false Colum, shunt at croup.
Experimental measured, data and optimization resulted energy fore cast be recover year out of total approximately 1560, 09of losses research 1560 measure and optimization.
-intelligence measure j
-input :balance threshold , reading group output : resolution
1 procedure: mismatch patter identification Netware weir
3 feature coef search ()
4 return features xoef
5 end
6 procedure analyse (features xoef)
7 begin
8search affected zone()
9search affected point ()
10 resolution match issue ()
11 return resolution.
12.end
14 procedure main()
15.
16while true so
For each grid €reading group
Begin
Read energy rec
BAL computer energy balance
For each bt€balance treshold group
Feature coef .missmatch patter resolution analyse feature
-case study detection non technical energy balance.

Research integrity frame work college project compagy and university high school topic policy asssessment, orientation Assement , methode research
Outcome: teacher lecture career skill
Checking engineering electrical and technical trade ,
-grade level and topic electricity,/education technology, technology electrical technologies, task ,for of assessment project/research tool:, subtopic substance ,mark allocation 70,
-report follow structure: education technology power city grid transmission,

Technology electrique city power transmission, are created news
-introduction: technology electrical ,and education technology, principal electrical engineering, model
Low mark allocation.

-body , education technology ,technology electricity transmission development

-Conclusion :
Resource extra research, visit local library book and magazine news papers, search internet, education technology, interview N engineering, teaching.
-project/ research : education technology implementation
-cover page ,name grade and topic
Learner and student college basic advance filling
Education technology, engineering electrical
-content index:
Introduction investigation and discuses in the report body-
Definition of education technology
City power, company mean low transmission, low substation, low
Ohm joule effect, reactance low ,
Circular assessment activities:
-assessment, subject , moderator, instruction, write nearly legibility education technology, Cognitive level questionnaire number mark, knowledge recall, comprehensive, application,analyse synthesis evaluation,100%
-Education technology, engineering electrical career offers to college principal seignior teacher.

Tendered value career total education trade consul bodies insurance bulletin

-Trade engineering diploma theory practical meet theory trade test score job testify low , examination theoretical statement mark total attested /

posted site / evaluation post

Trade test and examine national diplomat engineering, duty employer post

Subject time table allocation level	Theory Trade test Mark award 100%	Practice Trade test award 100%	Exam National Theory /test award 100%	Exam National Practical/ test isat award 100%	Grand total Score 400mark 100%,	Integrate assess score Min/max saqa aard qualify
N1/						
-trade theory electrical						
-indust -electro						
-eng-science						
-mathematic						

N2/

--trade
theory
electrical

-indust -
electro

-eng-science

-mathematic

-

-

-

N3

---trade
theory
electrical

-indust -
electro

-eng-science

-mathematic

-

-

N4

--electrotech
electrical

-indust -
electro

-eng-science

-mathematic

-electrotech

-logic syst

-

N5

--trade theory electrical

-indust - electro

-eng-science

-mathematic

-electrotech

-

N6-

--trade theory electrical

-indust - electro

-eng-science

-mathematic

-electrotech

-

-

N diploma -electrica enginering -total Career	Test total average License Theory 80% pass	Test Average License practical 80% pass	License total diploma undergraduate n diploma	License Average Undergraduate N diploma	License total	License 50% pass

-

-

Yes/not

Employer graduate close outcome license post engineering seignior, junior / years amend

Section 2

Engineering electrical career job workplace office place engineering outcome ,trade engineering outcom,education tech ingenieure work partnership visited meeting engineering, inovation college job functions,to government industrial experience function job.and gradient function job

industrial engineering electrical and social development.

By : TSHINGOMBEKB, tahitaditshingombe, me, tshingimbeKb

Seminaire session day confereence meeting café topic day

Presente : study governance career

Cvs title: governement and education job engineering college

Job duty:

Section 2

Tshingombe Tshitadi
engineering electrical
engineering electrical implementation time table to job time company experimental trade
tshingombefiston@gmail.com
Phone Number
Education
Study Program
st peace college
10/2020 - Present
,
jhb r
Courses
engineering electrical
Work Experience
Title/Position
city power training /st peace college training
02/2023 - Present
,
rsa
engineering electrical visited work place training experimental
Achievements/Tasks
award degree diploma saqa/ award panel wiring electrical
Contact

1.content: engineering electrical career project officer outcome legislation government engineering gov.city municipality engineering theory and practical experience engineering

1.1.scope of work workplace engineering career

2.summarise: assessment officer outcomes education technology engineering
: government .minister deputy government . framework mandatory compulsory student order.in order to determine research college order to work.and regulate
- home affairs department ;.general requireded work visa for temporary se jour time .v.fs.apppinrment letter completed valid ,pass port ndp critical saqa ,webmaster ..
Education department dhet basic..permit student .
Council education council trade . engineering council
Department labour and public work
Development.skill...juatice development
Power attorney.dol
I fracture social development

Department defense .police safety security
Sandf.saps psira seta permit bargaining sector competency fire arm gun operationel

-dti department trade industries.sector non proliferation the department of trade industry ,of weapons mass destruction council ,regulate strategic, protection interest , government control , implementation student workshop place visited ...
-Dmr.departement mineral energy..electricity sale revenue and prices power plant ,fuel use ,stocks,electricity independ ,national treasure economic sars department of energy mandate responsible ensuring private sector participation in pour generation through competition bidding process come regularity primary source development electricity sector
-department of science and innovation ,socio economic development goal,resource scie bono center career.
Programme administration technology innovation cooperation.
- programme research development support.
Purpose knowledge.,.strategies,objective, developed humain generation components
Basic science infrastucture implementation of research inovation equivalente,science .mission . astronomy.
R tax incentives ama.
Department economies sars economies empires ..
- national energy regulator of South Africa authority mandate ista regulate the electricity piped gaz and petrol ,consolid jurisdiction Coe chief officer legislation , invitation to comment amendment 3800 mW ministerial determination invitation comment net billing rules development , tribunal,info@ nersa organ.
- electrical conformance board ECB, South Africa ,designer ,installer and the regulator custome ,
- for profit find reseller cocs ,outlet online keeping for your client ,tech competence implementation dissemination stand ,address,standard,,,
Department economies:
How much is the total power supply consumption of ATM click 24;,5,52kw,,
Unite rptibke power auplie in banking and finance sector power challange ATM ,cost consume ATM 1,3kw auxiliare automatic teller machine ATM custome size

2.2. Abstract job work: function job work ,function gradient function function
3.entry engineering electrical trade infrastructure implementation support

Qualifications career category job skills:
4.purpose asssessor criteria recruitment job ask career education and training engineering office case study.
4.1 case study how to make calculation for a distribution substation

1010,4kv,2x1600KVA,mean introduction substation with an installed power of 2x1600 KVA are a typical,electrical power supply facilities which can value of all relevant physical quantities shall be major equipment inside

.-basic guide for calculation dimensionning will be adequate IEC standard and practical engineering experience,of course be side electrical there civil hand HVAC heating ventilation and air condition air.

-requirement. Substation which need,
Continuous current calculation and dimensioning.
-short circuit calculation and dimensioning.
- summary of selected equipment.
- substation :when say 2x1600kva that mean two power transformer each of theme with rated of 1600kva will be installed inside substation,
-strictly speaking but not necessarily 2×1600KVA designation assume on substation.capability coverage peak power demand of 2x1600=3200Kva that further implied parallel operation of transformer .I both transformer on the other hand want will be a working unity other serve as a spare designation (1600+1600)KVA ,
-the latter mean that substation
-this example, will be based on 3200KVA peak demand requirements, beside that other major input data necessary for for calculation and designated
- medium voltage rated value.
_low voltage rated value,short circuit power short circuit current, number supply cables,
-typical of earthing arrangements, maximum ambulant temperature single line diagram of distribution,
- substation is give supplies from 10kv distribution network via two cable typical solutions for so called typically of supply
Medium voltage switchigears design tag supplies power transformer design tag T1and T2 with voltage transformation ratio of 1010,4 kV power is further distributer to consumer on 0,4KV voltage level busbar system
-power substation design system and calculation study engineering
System planning short circuit studies load flow studies insulation coordinator study
-electrical protection and and control analysis DC system battery calculation.
-ac system auxiliary power transmission.
Ground grid study lightning protection calculation.
-light nint calculation voltage drops calculation conduit dill calculation civil structural substation design,
-land survey and site grading analysis,
-geotechnical investigation and foundation calculation structural ,
Miscellaneous substation designation noise calculation .
-designation calculation transformee noise calculation harmonic analyse,fire protection,
-Ask fact answe how content fault generators to grid loads flow conductor increased power, determine trip mva transmission correct power factor.
Outcome of auxiliary tfo ground gride studies drive general arrangements plan drawing

elevation section light.
-light calculation ,voltage drop 125 volt 90,PVC conduit
-outcome of conduits fill calcule wire pulled installed a combination Mont cable,
-land outcome survey determine feasibility creation storage result incorporated sit grading plan drawing,site grading ,
Power harmonic filter non linear , Draw power.

5.purpose and requireded: engineering problem mathematics engineering
-Calculation of electric field on substation equipment considering AC ion flow field ,increase of voltage in substation discharge surface high voltage conductor substation be coming influence,order stady AC substation criterion emittion calculate estimate 750kv conductor to ground distance 24,5 Conductor to 25,5 m phenomenon,

Activity day	Care log	Close tende

- Calculation emotion charge alternation cycle discreet time step time step instant balanced applied voltage.
Va=Vmax.sin (w(i-1)Δt..
Vb=Vmax.sin(w(i-1)Δt
VC=vmax.sun(w(i-1)Δt.
I=1,2,3 NT zero value value
Va= 0 VB=0,5 VC=+0,5
the first time step (I=1),. Vmax ,..vmin
Schema diagram line AC applied .
E+onset = nx(33,7+8.13/√r).kV/cm
E-onset=n(31,10x9,55/√r)kV/cm
-electrical field gth match point conductor.
Eg =3M sum Q si/2π€o[1/Rai+1/Rai.e.si]

Q on set a,sum m I qci,
Q onset b,sum 2m qci
Q onset c ,sum 3 m ,I 2m qci

6.required: 750 KVA Conductor,19,5;Min not , calculation motor starting calculation
- cable designing program,
-calculation home electrique load electrical bi.
-calculate electrical busbar size and size and drop ,
Calculate insulator resistance value,
-calculation numbers of lightings fitting and lumen output
-Calculation size of solar panels battery bank and inverter.
-circuit breaker tripping., conduit size selection program
-designation of earthing rate,
Selection of mccb,elcbfor main branch circuit
-selection of fuse and setting of instant short circuit tripping cb
Sharter circuit current calculation various point.
-size of capacitor for power factor improvement faulty current calculator.
-electrical safety program arc flash Calculation.
-E feeder and cable calculator
Squared selected capacitor size voltage drops calculation , voltage regulators distribution,
Resident load calculation.transformation .
-power line voltage faulty power line voltage drop calculation.
-electrical safety program arc Flash calculator ,power factor correction touche voltage ground electrique engineering Calculation engineering, calcule size circuit breakers for calcuationlofth,
Lighting pnot asssessment regut load lush calcuation ,diesel electromagnetic.

6.requirement : power station and central system
-generator KVA , measure 20kva ,3 phase generator has trues of 16(20x0,8)=16
Rating are available so KVA range of power our site 6kva,up500kva,20kva t 100kva
-generator full load Curt calculator calcule the full load current of a single 3phase generator voltage 120v,3ph AC generator 2kw ,pf0,8 cos
Generator faulty current calcuatir ,
-cable size calculator as ,
Parameter: ,rated voltage VP the rated voltage of the generator in volt v,
Phase specific the phase arrange in phase AC or 3 phase AC generator rating, specific the generator rating kW or KVA,cos
-full load current 3 phase generator specific kW.

I=1000xSkw/√3.VLL.cosπ .
S.kw is the generator in kilo watt (kW)
-VLL is the generator line to line rated voltage in .
- Calcule the full load current of a 50kw,480v,3 phase generator the estimated load power factor, 0,85
I=1000.50/√3.x480x0,85=70,8A
-full load current for 3 phase generator specified in KVA is calculed as .
I=1000xSkva/√3.VLL.
-sva is the generator rating kilivolt amp (KVA).
Is generator line .to line rated voltage in calculate the full load current of 50kva,480v,3phase
I=1000.50/√3.×480=60,1A.
-I=1000.Skw/vLN.xcosπ. ..
Vln is the generator line .to .neural rated voltage in volt cos(π).
2kw,120v, phase generator,0,85,,
I=1000.skva/vln..
I=1000x50/480=16,7A,
3000 watt ,3kw sign 120 ,of =0,8 ,,I=3000/120x0,8x31,2
I=10000/√3x120x0,8=60,1A,,,3 phase ,240 generator, I=10000/√3x240x0,8=30
7500w generator,of,
Load,I=7500/(120×0,8)=78,1A,
-multiplication factor for stand by load=100%. Of continuous load+50% of intermittent load,max peak operating load=100% of continued load +59,% of intermittent load + 10% of stand by normal operation.load with growth.
-
<u>Requireded:</u>
<u>appliance tv reliable,running</u> 200w,15,; starting ,
2300+1200+100 rated outputs.
-load listing calculation and generator sizing ration between absorbed power and rated
-motor between 0-kw-15kw. Load
-15kw-45kw,,45kw-150kw .
Efficiency % output inputs , kW consumed by motor absorbe x efficiency x power
Kvar consumer by motor =kw2+KVA
Multiplication factor for continued load =50%
Factor=110% of max normal operating load peak operating , growth factor °110% Of max peak generator size in 70 load factor peak load factor peak load factor peak operating load with operating load with growth factor

.

Version Francaise

8.Requirements:

Poste de travaille bureau d etude:

Accueil depanage et installation Electrique Sur renovation our neouf ,mise conformity de tableaux electrique,

_ pour la protection de personnel mise en place d UN Nombre adequate d interrupter differential 30 mA contre incs die mise en place disjoncteur remise aux norm de securite ,eliminer Les risque d incendie et ou ekecteisation des personnel lies usage d une installation Electrique defectuese ,

- verification installation si bessoin

-elimination des prise et interrupter defectuex des cable Mal isole , intervention Sur haute et base tension ,recherche de pannes, installation en Voix dinners,

8.1 electricite biocompatible, information,measure electromagnetic,mourn product

-meaure et analyse des champs electromegnetic,

Effect Sur la Sante CEM Liew exploision .

-prevention et curating issue anormalie spectre.

-CEM base frequency ligne HT et distribution 230v ,HT distribution appareillage domestic hyperfrequence pulse telephone Relais, telephone,detect WiFi,Bluetooth,

-lorsqu on procedeba la measure de champs electrique et magnetiaue priorite frequement au cours ,

- Les measures la measure de la resistance de votre terre,

La measure de champs electrique et magnitude.

- la measure des champs magnetic Haut frequency realisation d une cartography de la pollution electromagnetic a votre habitations une etude completed realisat par rapport information Sur Les risque norme et seuil sensibilite , proposition de solution aux problems consent

8.1 required :

-dimmensionnement et cablage de cable ,cequi relief Tous Les xomposant d UN system electrique Ce sont le cablage fournissent l energies source d'alimentation la distribution aux appareils aux Lumiere

-type de circuit : chute tensions a 10%non critique 0,6m,,51-61,,

-chutw tension a 3% critique 5A-200a, 0-2m ,

Calibre: maniere courant AwG American wire gauge method standard pour desigule diameter des file EST mesurant le diameter du conducteur measure uniquement course file,sans isolant ----calibre file .Europ,norm AwG 00,000,00,

Diameter mm 11,68,. 10,40. 9,27. 8,25

Section 107.1. 84,9. 67,5. 53.

Code couleur
-tableaux principal coefficient global ks×ku=0,69
IB=(80+60+100+50)×0,69=20 coffee regime normal
- etude d implementation d une ligne a haute tension our a Tres haute tension lignes aeriennes construction presentation.
- l' etude d implementation d une ligne Mele etroitment Les etude technique aux procedure administration le processus complet depend des regle en usage Dan's chaque pays cependant facing procede n EST .
- l objectif poursuivit burns dbentendu realiser une ligne electrique fiabilie court minimal Mais s integrant parfait email Dan's l environment l evitment des obstacle eat difficult de passage fort que Tracee evitment des obstacle eat difficult passage font que rarement une ligne droite lots de procedure administrative le parties mise hey sont
-les representant de l etat .
Les minister charge de l ectricite de l urbanism.
Les authorite regionanales prefecture.
- Les authorite militaire.les elu Avec depute Les senateur le Conseil general public a EC Les association et organisation Les explotant propietaire.
- calcul electrique logiciel note calcul
Electrique haute et base tension eclairage public Bureau d etudes.
-cance logiciel pour l etude reseaux Haut tension alimente courant alternating pour de tension comprise entre 10000V,et 246kv IL realise Les dimensions electrique Selin le norme nf. 13-200et ie. 60909..cebec

8.<u>2 requirenent dimension</u> reseaux hate tensions en fonction de via source d alimentation et quel que soir made d 'exploitation du reseaux mode Avec configuration court circuit minimum maximum mode normal our pertube et possible realiser fonctionnement different,
-la dimensionnement de cables en fonction des courants admnissible et des contraintes thermique ,
- le Seoul de reglage de protection .
- le calcul des temps de fusion des fusible selon course de fabricants .
-les courantsde court circuit maximum substransitaire , transitaire permeant triphase et biphase symetrique ,ICC Crete courant coupe courant permanent et default terre .
-les calcul des chute de tension Dan's Les canalisatiob electrique et aux bornes des recepteur en regime d 'etablir et au de marriage de moteur.longue du cable
-resistance electrique specifie I=P/U

Section cable effective.
A=Ixezl/Ua ....UN=12v ,p=100W,L=18,8 long conduit cable 1.8 m long conduct cable 1.8 m
2.I=P/In > 100/12=8,3A .
Section conduit cable
A=Ixexlua=8,3×0,018×18105=0,54 m .normalise 1=1mm
J=I/A >8,3A/1mm sq=8,3A density.
-les dimensionnement des appareils de protection Les courant de court circuit necessaire aux choix de caracteristique assignees des equipment et ou reglage de protection.
- le calcul de courants de court - circuit (ok) par la methode des impedance (NF EN 60-909) et partie 4NFC 13-200
-l ensemble des calcul realisation par sont confirm aux conformity avis technique guide practice ute calcyls des norme CEI ,6050202- et VDE 276. Modeliaer l installation schema unifilaire Avec affichage .
- dimension une Maison . Tenor compte de la tailed de Maison pour dimension.
- principaux critere pour dimensionner installation
- Dimension normalised
- dimension en fonction
- Nombre d equipment
8.1 etude different affichage des equipment des Donne's et resultat our Dan's chair etique etudier,Poste de livraison moteur generateur ,le calcul font la syntheses case
plus ,demarage,impression dossier.
- caracteristique de Tous Les equipment fonctionnementle calcul des courent des court circuit en Tous point
- de l installation et verification des conditions normative des cables en fonction de routes .
- reponsre aux obligation reglementaire attested
- information generales Sur project.
Carnet de cables au format tableaux .
Schema unifilaire des installation note calcul
- realisation atnoptique HT.
Rapport de calcul hr .
Plusier post Avec une touche hta et plusieur configuration de fonctionnement.
- reseaux de distribution jour et au find d UN mine .
- une partie du reseaux de distribution d une usine .
- alternateue asynchrone, alimentation de post satellite,bovine point neutre bpn ,courant d enxlenxhe ENT des transformatwur.
-Calculate du courant admissible Dan's la boucle .
- valeur de reglage de disjoncteur .
-valeur de faut des courant capacity.
-valeur de reglage des default homopolaire.

2.Fonctionnalites principales:

-calcul effective Selin Les normes .

- mise a jour des calxuls en temp reel,
- Haut tension et base tension .

Dimensionnement et verification, dimensionnement cable cable , variation de Vitesse ,appareil Trace software.logiciel pour la conception le dimensionnement installation haute tension base tension .

- Cree Les chema unifilaire d une installation Electrique hair base tension .
- applique Les normes national et ou international corresponding pregnant en compte.
- Les source et charge Les reglage protection ,la selective,la dilation et .
- obtenire et personnaliser Les information note issue.du schema et Les chema Avec Les schemas Avec levlogicial Les Plus courant dubsecteur ,imprimeur Les note de calcul, international,reel ,Dan's le meme projet d 'arcs electrique,d une installation Electrique Transpo (HT/htb..

8.2 note de calcul Bureau d 'etudes .

- realise une note de calcul Sur measure pour reponsre aux besoin specific des industries et simulet tester virtuellement

La terre.

Quece qu une note de calcule EST UN report calcul numerique systeme our de la piece en consition.

-calculation des structure statiaue dynamics

- correlation calcul essaies .modelisarion .note de calcul sismique pour test la tenure aux seismes.
- livrable Sur calcul vibrateur .
- tenue mecanique d une piece of d une effort et verifier si la piece Casse our non .,note de calcul Sur du thermique validation d UN nouveaux .
- billan de puissance Avec prise compte de coefficient de faisannement .extension .
- Gestion de la filiation et de la limitations.
- calcul des chute de tension,reperage auromatique St Manuel xomposant ,
- generation auromatique de la documentarion.
- generation auromatique de la .edition notes de calcule y compeis de note.
- base des Donne's constructeur .

-Gestion des borne Irv,1720.

Attributiin auromatique.module.

Coordinatiin simulation des different default de court circuit , contril de conformity , integration de Conte Sur boire optimisation

8.3 Bureau d etude . Marche European note calcul des Structure metallic Dan's l envelope du batiment euro code bureau base de calcul.

- action air Les structures,calcul des atrure beyond, calcul des structure en acier, calcul des Structure acier, calcul des Structure mixtrs,calcul structure Bois, calcul des ouvrage en

maconerie ,calcul geotechnical, conception dimensionnement,calcul des structure en alliage d alluminuim ,constitue des reglaes train champ application charge de beige action thermique .
- une Vue de la Structure,Les relanchement des Barres Les conditions aux appuies ,numerotion de noeud et Barre.,coordine de charge resultat reaction aux appuies aux deplacement aux contraint aux effort internet calculate
-8.7 calcul des charge du reseaux electrique.
- calcul ecoulement des charge Dans le reseau suit a la construction nouvelle station.
-Mission vise calculer le courant des ligne et Les tension des noieds apres la construction de plusieur station electrique et l about de Gros consomateur.
-elavorer la strategies patrimonial a long term du Parc,analyser different options contractual pour le renouvelle.
-demarche et results.missiin repose Sur la modernisation reseaux electrique .calculation et simulation
Group permetre Lance de calcul electrique chute de tension cable et transformateur en contraint intensity maximum.
- principales fonctionnalites.
Cartographie topologies de reseaux import dear information de la base abonne puissance souscritw consomation.personnalite de simulation de calcul Avec ajoute une extension visualisation graphics solutions collective.
- domain

.

9.<u>required domain d 'application distribution resaux</u> ;
29kv,r 49 ohm bovine j 49 ohm
-presentation plan protection hta troncon depart depart hta hey de Barre hta transo
htb ,E=EMF,Zd= impedance direct reseaux court circuit biphase default Se site entre Les phase 2 et 3j1=0=-j3.j2 courant circular Dan's le phase system omopolaire phase et la terre 2j2,=-j=(a-a) Ezd+z,. a=EJ.2π/3 Les impedance zd et Zi sont egalea d our ICC bophasee = j29 =oj30=√3.E2.zd.√3 ETA t inferieur a ICC,biphase EST inferieur a ICC 2 triphase ,
Default biphase ayant une resistance negligeable EST limited par impedance dear element dubreseaux ,iccb= UN 2.√Rl2+(xhtb+Xtb+xt.
Reglage des protectuin d une arriver.ioDS= jcw.vi.10a=Vo.O.iod= vi+j(r-cd)
_required. Protection dun alternateue , protection contre Les surcharge , protection contre Les court circuit ,
-parametre dimensionnement dielectrique d UN group.

On: puissance due moteur thermique ,UN : tension assignment fournie par l alternateue ,In courant assigned fournie par l alternateue ,
Ach principal d' in group electrogene analyse course protection norm our Les besoin dear application ,reglage protection surcharge au long retard dbouvien coirbe surcharge.
- pour raison economique levmotwur thermique d UN grouped replacement peut etre atrictment dimensioned pour sa puissance nominal s IL ya une aurxhage de puissance active le moteur diesel.
Billan de puissance active des charge prioritairw,une grouped de production doit pouvoire support Ter aurxhage d exploitation aurxhage d exploitation ,surcharge pour une Marche uni horaire.
-aurchage pour une Marche routes regime uniform.
Protection contre le court circuit s.
-les courants de court circuit eat d une courant aperiodic d UN courant sinusoidal ,irms..in..3..
Regime substransitaire,regime transitaire,regime permebt,alternateue Avec excitation compound surexite alternateue
- regime substransitaire apparition d UN court circuit aux bornes d UN alternateue,Les courant s etablit d'abord a une valeur relativement elevee order 6a 12In pendant premier cycle o a 20 mile second l amplitude d une Tel courant de court circuit eat definite par,
-rea tamce substransitaire de l 'alternateur.
- le niveaux d 'excitatiob prealable instant du default.
- l ' impedance du circuit default impedance court - circuit de l alternateue a consider t la reactance substransitaire Xd second expeime en % u. Tension phase neutre par la construction XD ohm = UN xd/100s
S=√3 Un.In..
Regime transitaire: Se site de 100 a 500 ms apres l apparition du default partire de la periode jusq 15,2fois le courant In
- le courant default pendant 10 second habituellement a 2 a 3 fois le courants.
- Plein charge de l alternateue calcule charge debl alternateue .
Calcul du courant de court circuit. Les constructeur precise en general Les valeur des impedance et constant necessaire analyse de fonctionnement en regiment transitaire our permebt debvaleur d impedance en %,Selin dear puissance a d 'alternater.,. KVA 75to 500, XD ,XD transitairexd permenebt,resistance etant toujour negligent deviant Les reactance intensity de court circuit en periode ,
icc3=U0/XD.1/√3..XD en ..
Icc3=In/XD .100.(xden %)..Ce valeur sont a rapport du courant de court circuit aux bornes d UN transformer
..dv/St and .Di/St..MOSFET gate different driver for electrique machine .breaker
- pour une meme puissance Les courants en CAS default proche d UN alternateue seront 5 a 6 fois plus faible que ceux cette difference EST encore Accenture par le fait que le groups electrogene our en general lorsque le reseaux BT eat alimente par source normal de 2000kva le

courant court circuit eat 42kva aux niveaux du jeux de Barres BT eat alimente par la source 2,grouped replacement de 509kva a reactance transitaire de 30% le courant de court circuit s etablit a 2,5 KVA environment soit une valeur 16 fois plus faible que Avec la source normal....peek

9.1 peak dv/St..Di/St turn on off dv /St .

Inductance definition derivation type quality metal iron cobalt non iron element , magnetic flux that is proportional to the rate of change of the magnetic field is known as induction,the amount of inductance requireded produces to an end could .

Factor influence inductance.

1the inductor wire has specifical number of turns..the material that was used to make core core appearance ,Faraday established the electromagnetic inductance low, derivaton of inductance look at a DC source that has the switch turned on the current flow from zero to a specific valeur causing a change it flow rate consider flux shift current flow measure in term time d¶/St use Faraday low of electromagnetic induction to solve the problem

E=N(d$/dt).,,E=

French version 8.Requirements: Study office workstation: Home troubleshooting and electrical installation On renovation our new, bringing conformity of electrical panels, _ for the protection of personnel installation of UN Adequate number of 30 mA differential switch against incs die installation of circuit breaker reset to safety standards, eliminate the risk of fire and or ekecteisation of personnel related to use of a faulty electrical installation, - check installation if necessary -elimination of faulty plugs and switches of poorly insulated cables, intervention on high and low voltage, troubleshooting, installation in Voice dinners, 8.1 biocompatible electricity, information, measure electromagnetic, mourn product - measurement and analysis of electromegnetic fields, Effect On Health CEM Liew exploision. - prevention and curating spectrum abnormality issue. -CEM base frequency HT line and 230v distribution, HT distribution domestic microwave equipment pulse telephone Relay, telephone, detect WiFi, Bluetooth, - when the measurement of electric and magnetic fields is frequently given priority during the course, - Measurements measure the resistance of your earth, Measurement of electric fields and magnitude. - the measurement of high frequency magnetic fields realization of a cartography of the electromagnetic pollution at your dwellings a completed study carried out in

relation to information on the standard risk and sensitivity threshold, proposal for a solution to the problems consents 8.required: -dimensioning and cabling of cable, which relief All the components of an electrical system These are the cabling supplying the energies power source the distribution to the devices to the Light - type of circuit: voltage drop at 10% non-critical 0.6m,,51-61,, -chutw voltage at 3% critical 5A-200a, 0-2m, Gauge: current way AwG American wire gauge method standard for desigule diameter of wires EST measuring the diameter of the conductor measures only run wire, without insulation ---- gauge file .Europ, norm AwG 00,000,00, Diameter mm 11.68,. 10.40. 9.27. 8.25 Section 107.1. 84.9. 67.5. 53. Color code - main tables overall coefficient ks×ku=0.69 IB=(80+60+100+50)×0.69=20 normal coffee regime - study of implementation of a high voltage line or very high voltage overhead lines construction presentation. - the study of implementation of a line Mixed closely The technical study with the administration procedure the complete process depends on the rules in use in each country however facing process n IS. - the objective pursued burns relaxed to achieve a reliable electrical line short minimum But integrating perfectly email bet hey are - the representatives of the state. The ministers in charge of electricity and town planning. The prefectural regional authorities. - The military authorities. The elected With deputy The senator the General public council at EC The association and organization The operating owner. - electrical calculation software note calculation High and low voltage electrical public lighting Design office. -cance software for the study of high voltage networks supplies alternating current for voltages between 10000V and 246kv IT realizes the electrical dimensions according to the nf standard. 13-200and ie. 60909..cebec 8.requirenent network size voltages depending on via power source and regardless of network operating mode With configuration short circuit minimum maximum normal mode or disrupted and possible to achieve different operation, - the sizing of cables according to the admissible currents and the thermal constraints, - the protection setting Seoul. - the calculation of fuse melting times according to manufacturers' race. - the maximum short-circuit currents, subtransmission, three-phase and symmetric two-phase permanent transit, ICC Peak current interrupting permanent current and earth fault. - the calculation of the voltage drops in the electrical pipes and at the terminals of the receivers in the establishment mode and at the motor marriage. long length of the cable - electrical resistance specified I=P/U Effective cable section. A=Ixezl/Ua ....UN=12v ,p=100W,L=18.8 long conduct cable 1.8 m long conduct cable 1.8 m 2.I=P/In > 100/12=8.3A . Cable conduit section A=Ixexlua=8.3×0.018×18105=0.54 m .normalized 1=1mm J=I/A >8.3A/1mm sq=8.3A density. - the sizing of the protection devices The short-circuit current necessary for the choices of characteristics assigned to the equipment and or protection settings. - the calculation of short - circuit currents (ok) by the impedance method (NF EN 60-909) and part 4NFC 13-200 - all the calculations carried out by are confirmed with the conformity technical advice guide pr

.10.of electromagnetic induction to solve the problem ;

E=N(d$/St)..where n is the coils number turns write equation E=-N(d$/St)..E=L(Di/DT).....HI=NI..denote the magnetic ,B = u.H... l= NBA/H.f

L=u.N.2.A./L= u.N.π.r.r./l...

Type of induction the magnetic flux associate with a coil or circuits change any type .

- coefficient of self induction the current is proportional to the number of flux linkage with the coil,N$ is directly proportional or N $ is the number of turn could coefficient L=(N$i)..I=I amp..N=I L=¶,I Faraday N(d$/St).e=-l(Di/dt) and.

Units and dimensional formula of l it's S.I unit Webber / amp =joule Amp ,coulomb x volt amp = volt sectbamo = ohm x sec ,,M=M.L.l.t.r.A.A.....

M=K.L1.M.L2.magnetic series..La=L1+l2...la=l1+l2....

La=l1+l2+ parallel ,l=6H,. F=70HZ.,x=2.π.f.l.....x=2×3,14×70×6=2637,6

..calculus question .f(x)DX calculus according to the ohm low formula for a capacitor , capacitor currents is proportional to the time derivative of capacitor voltage, I=C.dv/St.. capacitor differentiative voltage with respect to time and this time derivatt voltage of voltage.

advanced calculus instateneous rate of change of an (x,y) ..[Dy/DX]. ,I=E/E,,,G=1/R...I= C.de/St..variable for current (I) and voltage.

- Capacitor store energy in the form of an electrical field, calculate the energy stored in a capacitance by integrating the capacitor currents (p=I.V)..over time since we know that power is the rate work (w) is done work from (w) is done work from zero voltage ,P= dw/DT,, dw=P.dt....capacitance (c) and voltage + v) into the integrand energy capacitor capacitance, integrak .f(x)DX .. DC input output ...dvout/St..v.in ..integral

. integral out ..integral .To vin dt...

R=dv/Di.. equation diode...x=Dy/dt.(x)..y=I/int.dt

-application electrotechnique circuit rlx transformateur eclairage

Log activity day	Care day	Description calcul	Close calculation	Yes/not

11.required : besoin en energies de reglage dimension,
-determination des besoins en puissance de reglage secondaire et reserve de minute ,
- la puissance reglage secondaire et reserve minute a reserve sont dimensionnement.
-conjointment par le quote date de livraison ,le dimensit n EST plus effective trimesteiellement pour le trimesteeaui a Mais individual
-desequilibres historique du system Les pannes Se central sont exclu .

- probalite statistics de faillance des different type centre d une puissance en compte 100mv ,
- classification de dinners d entre heur date Mais jour Ferrier , details de la procedure de dimensionnement,sont dispnibles Dan's l a is Sur le dimensionnement dynamic tranche horaire de jour ,
- dimensionnement des besoins fcr

La puissance de la frequency contrainement reserve maintenir par la get allement gestionneur reseaux ,

- quantite total syst internet ,Dan's Les aystt interconnected d Europe continental resulte de la pertubatiin de +-3000Mw ou d' une dimensionnement probaliste tenant compte de diffet facteur influence doit garantire que la

12.1 electricite ligne a haute tension ..production

,Total estime TWh,,nuclear estime % , hydraulic au file d way ,autre renouvela le, thermique a flannel % non renouvellable, thermique a flammable,

-consommable totalperte, finale,par habitant TWh, manage agriculture , industries,service %,. Transport services , commerce %, commerce exterieyr importation TWh, exportation twt ,
-Energy relever des compteur et calcul de la consommatiob ,gestionnairw de reseaux distribution,
- lire Les index Sur Mon compteur d electricite our de gaz.
-fiche pratique,relever estimate 9209meter cube, chiffre 23355kwh ,si Mon compteur electrique a deux Plein heure , heure Creuse, Je relevelea xhiffres indique numero compteur ,15,237kwh,. 12458kwh ..

12.2. Measure des harmoniques Dan's Les reseaux electrique, procedure pour l analyse harmoniques du resaux ,
-action correctives ponctuelle,action preventivea a long term ,
-Quel appareil pour measure CES indicateur ,
-Quel rang d'hanarmorique procedure pour l analyse ,harmoniques du reseaux ,measure des harmoniques realise Sur site industrial.
-A titre preventif a fin d 'avoir une Vue globale Sur l 'etat du reseaux. Cartograph du reseaux,
-en Vue de measure corrective a fin de termine corrective a fin determine l'origine perturbation solution require pour l eliminer,
-port verified la validite d 'une solutions a la suite de modification Dan's le reseau de distribution pour verifier la reduction
- Les indicateur harmoniques peut etre measure expert present Sur la site pour periode temp limiter par instrument de measure installed fonction pandant UN temp period au dispositive determiner.
-action correctives: lorsque pertubatiin sont observe harmoniques sont suspect de measure ,courant et tension sont effective aux niveaux debla source d'alimentation heux de Barre du tgbr Sur chaque depart tableux general ,pour de result fonctionnement installatt etat batteries condensateur Nombre de garden ,
- determiner l'eventuel declassement necessaire des equipment.

-determiner le calibre de routes Les system de protection et filtre necessait d emission harmoniques maximal admisst
Action preventivea a longu term.
- permenebt measure ,measure certain Nombre de point, different installation Sur period situation.
-fluctuatiin source d 'alimentation.
-variation Dan's Les fonctionnement ,ajout de Nouveau equipment,
-des appareillage measure installed aux reseaux de distribution permetre des appareils des measure installed permanance derectent Suive .
-poye une Evacuation global de l 'etat du reseaux analyse preventive,
-la location de material de measure l 'appwl expert ,la connexit et deconnexion,d 'eqyipement de measure pour l 'evaluatio. Global de l etat du reseaux, l analyse Sur le tableau general,base tension oar l 'appareil arrive et ou appareilmesure equipe chaque depart ,
- pour Les action corrective IL EST possible ,determine le condition foncty ay moment de l incendie,
-desser une carte reseaux evaluation mise ouvre.
-quel appareil pour measure CES indicateur a,Les appareil measure dournisse des information valeur instance harmonies, sont conxue selon norm CEI 6100-7..CEM.. technique d essaies,this angle tensions indicateur long term 10minutw,period 1 semain,tension harmoniques maximal norm en 50160 caracterisa valeur .
-harmonique impaired non multiple,rang,ampli relative,
-harmonique impaired multiple de 3,amplitude relative UN ,
-harmonique pairs rang amplitude relative ,
-instrumwnt portable ocilloscop,indication distortion courant ,analyser numerical Fourier alfo I -U ,10 sys ,50hz 12 period 69h
-les cout des perte du transformateur court annual du pertes .
-les lertes annuel d UN transformateur eat evaluee for
Wperte=(Po+Pk×k.k)×8760..
Wperte Montana des pertes annuelle en kWh .
-Po: pertes a video en kW ,
Parameter ,specified Dan's .
La caracteristique du transformateur ..Pk perte en charge en kW ,parameter specifies envdans le caracteristique du transformateur.
-k: facteur de charge ponderee Sur l 'anne ,,,8769 : Nombre d' heures de fonctionnementlm. Dan's l 'annee (24/24,365jl.)
- decharge ponderation Sur une journee Sur site industrial ,
Facteur de charge ,pondered,
- Sur UN jour (1440 minute) de charge
Formulae √sum t-1440,t=o..k.k.indice k xt ..
√(0,3)exp2×150+0,65 exp

3×(240+(0,85)(0,85)×330+(0,5)(0,5)×90+(0,85)(0,85)×510+(0,3)(0,3)x120)/1440
-chargr pondered journaliere eat Alor 0,724.
-chargr pondered annual vaut
√ j365 sum j=1 k.x.j /365..

CTA pertes = C× W pert X (1+I)exp n-1/I×(I+I)exp
- court total acrualiae de Perte.
C: evaluation du court Moye. Par kWh par an ,
W Peete , perte annuelle
I: taux d ' actualization,
n : durede vie esperesy trans global dea transformateur evaluation economic l achat d UN tranafo ,actualisation Cour global long sure vie achat

-CTO=PP-AxPo+Ok..
..pp :court d' achat du transfo,
A court perte a video ,Po total perte a video (€/w).
B: Cour de perte due charge exp €/w
Ok: perte du charge gaewntie .
A=Ckwh×8760(I+I)expn-1/i×(I+I)exp .n ..
B=Ckwh×8769×k×k(I+I).exp.n/1×(I+I) exp.n
-I: taux d actualisation (%.
n:sure de vie en arc.
Ckwh : prix du kWh (€/kWh)..,
8760: Nombre d 'heure de fonctionnement Dan's l ' annee 24/24,365 j ,
K:facteur charge pondered ,selecteur industrial, UE -27 charge moyen ,40%,70,%
-donne,
Type du transformateur 1000kvA ,
- charge moyenne : 65% (24/24)
-cos π moyen de la charge :0,90.
- Suree de vie economique 29ams ,
- Cour de l ' energy : 0,06 euro
12.required: NF..50464-1
-1pertes a video ,perte did 14000,perte coc 1100, perte Bob,perte Aop.
-2 perte du charge a la charge ,perte DoD,perte coc,perte perte,
3.cout indicator ref DoD ,perte DoD ,perte perte ,perte A,a
4.perte annuelle kW,
5.rendement perte.98,95,pertecox 99,16,98, 99,39
6.Perte a vide ,12264,96368234,6745,

7.perte due la charge kWh ,48114,38862,33319,
8. Total kWh ,
9.xout annuel de perte,perte Vue perte charge,,

14..Billant matiere ,,concentrateur ,indicateur . cuivre revenue, rejected 100% plumb .metallurgie luxiviation.. geotechnical
1

to

15.probabilte d UN evenement EST Nombre d issues favorable devise par le nom re d issue total .
P(A)=1-P(A),,P(AouB)=P(A)+P(B)..
.. 15.1 requireded: Usinage fabrication une mecanique qui necessite une interrupter et fusible Vue que l usine achete CES componasa ts electrique en Grande quantite.,des interrupter achete soient defectuese ingenieure qui travaille recolt dinnwr,Sur la defUlkan e de CES appareillage don't certaines sont resume,
-defectuex interupteur 6, fusible ..total
-no. Defectue interupteur 182..fusible ,total,
-total interupteur ,et fusible 208.
-probalite q UN interrupter soit defectuex ,-su la probabiltw q UN fusible soit defectuex EST une fusi le soit deferues EST 9,9625,combiende fusible so t bon ,Sikes interupteur et UN fusible defetue ay hazard ,en deduire la probalite xhouaire in interrupteur our d UN fusible qui be fonctionnement pas,divider nom re des interrupteur Nombre d interrupteur Somme des Nombre interrupter defectuex ,6-182=188,
P(N) =6/188=3/94=0,0319 si la probabiltw q UN fusible soit defectuex de 9,0625 ..soit avenement f qu UN interrupter soit defectuex 1-0,0625=0,936..

15.1.required: need for dimension adjustment energies, -determination of secondary control power requirements and minute reserve, - the secondary adjustment power and minute reserve to reserve are dimensioned. - jointly by the delivery date quote, the dimension IS no longer effective quarterly for the quarterly individual but - System history imbalances Central Se failures are excluded. - probability statistics of failure of the different type of center with a power of 100mv, - classification of dinners between time and date but Ferrier day, details of the sizing procedure, are available in the dynamic sizing time slot of the day, - sizing of fcr needs The

power of the frequency constraint reserve maintained by the network manager get all the way, - total internet system quantity, In Continental Europe's interconnected systems result from the disturbance of +-3000Mw or from probalistic sizing taking into account the diffet influence factor must guarantee that the 12.1 electricity high voltage line ..production ,Total estimated TWh,,nuclear estimated %, hydraulic in line d way, other renewed, thermal flannel % non-renewable, thermal flammable, - total consumable loss, final, per capita TWh, manage agriculture, industries, service %,. Transport services, trade %, foreign trade import TWh, export twt, -Energy reading meters and calculating consumption, management of distribution networks, - read the indexes on my electricity or gas meter. -practical sheet, find estimate 9209 cubic meter, figure 23355kwh, if My electric meter has two Full hour, Off-peak hour, I relevelea xhiffres indicates meter number, 15,237kwh,. 12458kwh.. 12.2. Measurement of harmonics Dan's Electrical networks, procedure for the harmonic analysis of the network, - one-time corrective action, long-term preventive action, - Which device to measure CES indicator, -What rank of hanarmoric procedure for the analysis, harmonics of the network, measurement of the harmonics carried out On industrial site. -As a preventive measure in order to have an overall view of the state of the network. Network Mapper, -en View of corrective measure at end of end corrective at end determines the origin of the disturbance solution required to eliminate it, -port verified the validity of a solution following modification in the distribution network to verify the reduction - The harmonic indicators can be measured by an expert present on the site for a temp period limited by a measuring instrument installed function during a temp period on the device to determine. - corrective action: when disturbances are observed, harmonics are suspected of measurement, current and voltage are effective at the levels of the power source hey of the bar of the tgbr On each departure general table, for the result of operation installatt state capacitor batteries Number of garden, - determine any necessary downgrading of equipment. -determine the caliber of roads The protection system and filter required maximum allowable harmonic emission Long-term preventive action. - permenebt measure, measure certain Number of points, different installation On period situation. - fluctuatiin power source. - variation Dan's Operation, addition of New equipment, -measure devices installed in distribution networks allow devices to measure installed permanance derectent Follow . - poye a global Evacuation of the state of the networks preventive analysis, - rental of measurement equipment for the appwl expert, connection and disconnection, measurement equipment for the evaluation. Overall state of the network, analysis On the general panel, low voltage where the device arrives and where the measured device is equipped each departure, - for corrective action IT IS possible to determine the functional condition at the time of the fire, -draw an evaluation network card opened. -which device to measure CES indicator a,The measuring device provides information on instance harmonic values, are designed according to norm IEC 6100-7..CEM.. test technique,this angle voltage indicator long term 10minutw,period 1 week,voltage harmonics maximum norm in 50160 characterized value. - non-multiple impaired harmonic, rank, relative amp, - harmonic impaired multiple of 3, relative amplitude UN, - harmonic even rank relative amplitude, - portable ocilloscop instrument, current distortion

indication, numerical analysis Fourier alfo I - U, 10 sys, 50hz 12 period 69h - the cost of transformer losses short annual losses. - the annual letters of a processor are evaluated for Wloss=(Po+Pk×k.k)×8760.. Wloss Montana of annual losses in kWh. -Po: video losses in kW, Parameter, specified Dan's. The characteristic of the transformer ..Pk load loss in kW

16.requirement : function functions..

Psychology's b, function job analysis function job analysis is the examing job requirements ,and assigning the right conditions, qualifications no rwing condctu no arm ,lifting ,
-functional job analysis is method used hr (I/o) psychologie expectation of their specifical position private .
-project work job roles that requires intermediate math skill essential job roles call ,job role alarming state math skill ,job roles for those with intermediate ,how to use intermedt create an assessment group arround ,valuable and important resource in any company job emphasis on qualitative assessment.
-work or conducted that require cooperation between management compagny and its workers

a typical compagny workshop ,communication verbak Please to grade the output employer,
-Different classification system for the position analysis question Aire is standard position.
- functiin : job analysis is qualitative assessment form Whixh means focus combine organisation impact overall operate conducting assessment,
-Compagnies and organisations scrutinise virtually .
- the scale of workplace definitely.
The are many ways to conduct functional occupation analyse but measure scales data thing instruction ,scales reason ,math language, resource, employee supplier to employees job physical measure , qualifications measure ,
- psychomotor : and psysical requirements of job the job analyse survey is mostly used rate the functionni requireded of job rating. The function Al rating analyse process may occupation analysis,
-job description: ,resulting from the primary resultat of a job analyse job session is new job description function hr DEP ,security duty statement offer.
-Categories of information regard both job prospective,things data worker instruction ..
Function job analyse :user computer to collected and collate data and draw conclusions, constructy worker use home physical tools to accomple building task,the tools must be as up date as possit collective conditions candiat for position,process relevant compagny work instruction basic , completed .
Function in the real world when we introduce student to the functions we typically bring the concept to life through the idea of function machines but function.
Function machines s: students easily grasp of funct machine input something happen .function rules and input can predict the output determine the input image imagine if input ..metaphors event nby setting a large card input slot machine mysterious function rules,student input the class ,input 4,5
Output 5,15..find the composition function in loving 2or more functy the teacher or student create spread sheet function machiy, job functions sound .job title ,job read roles
-job function meaning: wath is the purpose of job functions is a job positions to give completed description of the primary responsabilite ,the emplee will perform we define,job functions as a detailed list of employee action and duties part the roles job function ..job function vary position but list job supervisor department team provide support training to support meme er protocode for increase maintence a working document.of best practices,report to director: job it clear great ,job function ,work function essential work function essential functions work funxty .job it clear great .job function essential functions .
-job function vs job titles a job function is usually list of responsibilitie ,job title ,tags ,job description job content,job descrip management..
-gradie t in real life ,part wath is a line line extend fevere beyond director a line segments ray end point , gradient of a line .want to keep learning math subject knowledge graphs function solving equations..
Y=4x.x.x-2x.x+7.....0point (1,9)

Take derivation respect 12x.z-4x...coordone (x=1)=...x gradient = 12(1)+1)-+4(1)=8..gradient function (1,9)is 8
- to find the gradient of function point slop point derivative point ,find vector function .problem to calcule gradient of this loss function ..
- .c (y,w,xb) 1/n,nsum..I=1 max find derivation vector is network dual quantity neural matrix operatt .
-Gradient of scalar function ..
f(x,y)=3.x.x.t hange to change function partial derivatives..gradient
g(x,y) ..matrix ..y1=F1(x)=X1. .y2=f2(x)=X2, yn.fn(x)=xn

17. Requireded: calcul taux de charge eat le rapport en pour ,du courant preleve aux borne du disjoncteur ceat Somme des courants transitaire Dan's Les canalisatiob different Sur courent nominal transfo.
-Inontra transfo=I1+I2+I3+I4..Disjonc transfo 400kvA,, charge different ..
Heure,, depart 1phase 1.2 3 amperage
14h00
20h000..

18.required : government .minister deputy government . framework mandatory compulsory student order.in order to determine research college order to work.and regulate
- home affairs department.general requireded work visa for temporary se jour
time .v.fs.apppinrment letter completed valid ,pass port ndp critical saqa ,webmaster ..
Education department dhet basic..permit student .
Council education council trade . engineering council
Department labour and public work

Development.skill...juatice development
Power attorney.dol
I fracture social development

Department defense .police safety security
Sandf.saps psira seta permit bargaining sector competency fire arm gun operationel

-dti department trade industries.sector non proliferation the department of trade industry ,of weapons mass destruction council ,regulate strategic, protection interest , government control , implementation student workshop place visited ...
-Dmr.departement mineral energy..electricity sale revenue and prices power plant ,fuel use ,stocks,electricity independ ,national treasure economic sars department of energy mandate responsible ensuring private sector participation in pour generation through competition bidding process come regularity primary source development electricity sector
-department of science and innovation ,socio economic development goal,resource scie bono center career.
Programme administration technology innovation cooperation.
- programme research development support.
Purpose knowledge.,.strategies,objective, developed humain generation components
Basic science infrastucture implementation of research inovation equivalente,science .mission . astronomy.
R tax incentives ama.
Department economies sars economies empires ..
- national energy regulator of South Africa authority mandate ista regulate the electricity piped gaz and petrol ,consolid jurisdiction Coe chief officer legislation , invitation to comment amendment 3800 mW ministerial determination invitation comment net billing rules development , tribunal,info@ nersa organ.
- electrical conformance board ECB, South Africa ,designer ,installer and the regulator custome ,
- for profit find reseller cocs ,outlet online keeping for your client ,tech competence implementation dissemination stand ,address,standard,,,
Department economies:
 How much is the total power supply consumption of ATM click 24;,5,52kw,,
Uniterptibke power auplie in banking and finance sector power challange ATM ,cost consume ATM 1,3kw auxiliare automatic teller machine ATM custome size,

18. Requireded: energetical electrotech energy and electroenegetical ,mass government , weighting government products v

net metering basic,metering credit ,calculation and billing , designing net metering faculties, common mistakes, minimum, monthly reliability , additional resource ,mass
- renewal .electrical compagny state low
Requireded.
-distributiin compagny ever source and private megawate ,,national gride ,electrical and private cap megawat.
-small hydro electrical
- class number and size private facility
-class1 metering and 60kw or less.
-class2 , 60 kW ,mW
-claaa metering facility ,2mw,type, sust ,assurence metering dockets system rules single parcels sub division,owner or operator , municipality ,10mw ,self designed comin mystek .

-eskom entrepreneurs commissioner electrical split meter program, Eskom Gauteng electricity network infrastructure upgrade programme ,main objective initiavie, reliability aupllt and empowering them to control and manage their consumption is currently rolling out smart prepaid metre in Sandton specific targeting ,mall programme , consultation process , meeting,castomer educate , customer awareness,fortune ward meeting, explainning benefic free basic electricity ,
Bloc tariff .
The meter ciy,costomer interface unite ,smart prepayment split metering solutions, remotely,display,smart metter ,allow,capable two way communication, between custome road , information meter , programming up dates,automated , instruction sent to the meter to interrupt,
-the power supply prepaid ,
-meter/demonstrate//CIU///
19.1 Circuit diagram of analogies energy meter:-
System input phase parallel act DC power supplies,counter kWh ,load side

Line voltage,PGA or,ADC2,ADC1,X,and digital ..residential outlet.
- system control =1,display =1,quadrant metrology processor =1, voltage sensor =1, current sensor=1, terminl block=1,

-digital energy meter ,powers supllies yes and max 2,3,2=1,Db connector =1,smart card reader , micro controller l =1, optocouple =1,load digital energy meter ,relay ,LCD,main spply

<u>19.2requirement: ATM term standard automae teller machine it an electronic device that is used only bank customer to process account transaction the user access their</u> account their account through a special type of plastic,card that is encoded with used information on a magnet atric the strip contain an indentification coderhat is transmitted to the bank central computer but modem the used insert the card into atm to access the account and process their account transaction invented but jgon shepherd in 1969..

Bloc diagram for arm machine system ,
-start yes,walking to insert card y es, insert , waiting to enter yes the pin yes, waiting to check to pin yes , waiting to enter amounts yes, waiting to enter amount yes, verify balance yes,get cash,in correct pin eject,
-users or engineering entry exit hard , generic iso ,IEC model for functional sizes measure.
Block diagram ATM ..
High security module yes memory test,key pad yes car reader yes ,etc yes cental unit output lcddriver yes display yes, motor driver output yes,speak driver yes, relay yes AC switch driver yes ,ethernet yes and dsk yes communication,powerreser yes,power supplies yes standard device,
-input device the input device like card reader and keypad,
Card reader :the card is an input device read data from a card,card is part of the identification particular account number and the magnetic stripe on the backside of the ATM card is used for connection with the card the card swiped pressed ,jet pad,after machine ask identification unique balance inquiring pin so draw money

20.required:une case diagram for Bank ATM systems ,system aliw custome access clerk cashier or bank teller work ,step authenticak ATM plastic ATM card users name and pin ,user name and pin ,use case diagram for .
-check balance yes , deposit funds yes, withdrawal cash yes , deposit funds yes , atm transit yes , extension point menus provide, custome yes, custome button yes extension,atmb..
-enter card used name ,invalid,request ,with draw display ,case diagrams Bank ATM , maintence yes, repair yes,replanch yes up grade diagnosis,

-software engineering ,state transition diagram for an ATM systems,use case diagram for library management system,
-use case diagram for online banking.
-DFD for ATM systems,
-difference between use case and test case.
-state diagram for online banking system.yes
-Data flow diagram for online banking system.yes
-Class2 diagram for mall management system.
-class2 diagram for hotel manage system .
- class diagram for theatre management system .
-class2 diagram for bus standard.
-class2 diagram for airpor management system.
-Class diagram for scholaire.
-software class test .
- rules for data flow diagram.
- components basic diagram.
-short note activity.
Information system development.
.. components diagram.
Customer Console yes..ATM machine yes ,bank database yes ,card record yes, atm transit yes,employee Consol yes ,client yes desktop yes,
- flow charter organisation concept map network diagram,use case mind mapping ,wire frame, Orders yes, item yes, product yes, custome yes,

-----+++schematic diagram of the printer.
Inspect camera yes, pressure control yes,temperature control yes, amplification yes ,jet driver yes , control yes system ,".y motion controller temperature control yes,

21.required : engineering electrical . machinery motor and generation AC DC
courent..transformer.relay contactor field electrotech..
.contents : namenclature and name plate information..I'd permit,, step 1
-Dc motor theory ,step 2 disassembly ,step 3,step 4 armaturea, steps 5 frames, 6vemtilation and accessories,7step ventilation and accessories ,step 8 motor assembly and final test ,step on site troubleshooting ,step faillure analyse ,step DC machine data sheet ,carbon bushes , current , density and performance,step installation ,step startup and Basile information,step operationel monitoring and maintenance,step motor and baseline installation data,how to read a motor nameplate,step motor storage recommand
-step how to rewinding and electric motor ,step disassembly motor , steps wipe off,step remove the motor ,step pictures step force armature ,step cut the old winding,tips enamel or nulon and polurethane coated magnetic wire ,
-step electric motor insulation papper,step utility knife step wire cutter,flat blade screwdriver plier lint ,free cloth work gloves , motor rewinding process,
+ 1 remove windings,removal insulation papper clean housing,burn remnant of insulation, prepare new winding ,on a spool,insert new insulation papper into housing ,papper into ,step solder and insulate windings end .plie off solder end ,varnish windings reasemble motor test.
-analyse 3 ph 3000rpm magnetic field , motor inscription board , motor nominal voltage nominal current.pf rotation r.p.m 5%frame 1,5disamble removal bearing pain,
-calculation parameters for New winding
IP 87 mm, Db =128,2mm,75,5mm,package dimensionnement of iron core measure length of stator package io =87mm,
- diameter of stator package Dv=128mm inner diameter of stator package D=75,5 mm number of stator gaps z=24
-step calculation of parameters for New winding

Now measure dimension of stators slot , width of stator slot ,b1=6,621mm , b2=8,5 mm height of stator slot h = 13,267mm opening of stator slot ,no=2mm, height of slots neck a 1=0,641mm tooth width bz =3,981mm

-Qu=π/B.(b1.b1 +b2.b2)+h/2(b1.b2)..

day		

e=Qu=π.b.b/4+hb..

-calculate number of poles pair ..
P=60.f/NS=60×50/3000=1..pole number ,speed 2810..
-calculate pole step £=π×D/2.p=3,14×75,5/2,1=118,53mm.
-t: pole step,
-calculation pole surface .
Qp=T.lp=11853,87=1031211mm,,=103,12mm
-calculate pole surface:
Heig of lamel 1mm 0,50 to

-heigh of lamel in m 0,50 to 0,65
Type of isolation papper 0,88 to 0,90
-lacquer 0,90 to 0,92 , phosphate 0,92 0,94 no isolateur 0,99
Iz = Ki .LP = 0,92×87=80.04m

-calculation of the tooth length Hz = Hu+a1=B,267+0,691=13,908m,,
hz-tooth length, Hu height of stator ,
- calculation height of the yoke stator ..
hj=1/2(Dv-D-2.hz)..
=1/2.(128-75,5-2,13,907)=12,342mm..
-hy :heigh of the yoke ,Dv external diameter.
-step calculation the cross section of teeth of one pole .
Qz=z.bz.iz/2.p=24.×3981×80,04/2×1=3823,67mm=38,237cm ,cm
-Qz one - tooth cross section, z number of slots,bz tooth ,width qualation of slots
-Q4=π/8.(b1.b1+b2.b2)+h/2(b1+b2)=

Day			

π/8.((6,621)(6,64)+(8,5)(8,5))+ 6,621+8,5)=93,4mm

-calculation numbers of slots per pole an

..q=z/2.pm=24/2.1.3=4

.q- number of slots perpoles ,z= number of slots-

Step calculation of pole step inslots £=z/2.p=24/2×1=12.

Winding factor

..q=1,3,4,5,6,7,8,9

..€=1, ..0,99..0,960...0,95...

-€=€z+€r....

21. Requireded:calcuation of the induction in the teeth of the stator ,

-Bz=Bzr.×Qp/Qz=0,65×103.12/38.237=1,753T.

Bz : induction in teeth of stator ,bzr induction in air gap.

- calcuation of the magnetic flux of one pair of poles .

d= Bzr.Qp/1.5 exp.7 =0,65×103×13.(10)(10)(10)(10).=0,00427wb

.¶= magnetic flux per pole Webber.

-calculation of the calcuation .
Number of turn in the phase .
W=0,22.uf.a/d.f.€=0,22×230×1/0,0427×50×0,958=247,39..W- Calcuation number of turn in coil ,if phase voltage ,
- a number of parallel branch..
-flux of I pole Paire ,
Step calculation of calculation number of turn in slot, Du=6.w/z=6,247/24=61,75,,
Su calcuation number of turn .filing
-Calculation of cross section of wire .
q'v=Qu.fu/du=93,4×0,34/62=0,512mm
q'v= cross section of the wire , ..
Qu=surface.of slot.
Step calculation of thickness of wire
DZ=2.√q.v/π=2.√0,512/3,14=0,807,..q'v cross section of the wire mm.+/2% range of resultat picked 0,8 mm wire measure length connected of reassemble,motor ,400v,380v...

23.Requireded: an Expiremental in transformer rewinding Instructables,
-step : material and tools ,step2: dismantle the core step 3un rewinding the old , secondary ,,
Step determine the wire thickness , steps 5,test winding ,step 6,
-purpose of rewinding of Dore keep the transformer from buzzing and to seal it form environment the lamination hard to removes measure volt , material blowtar h ,hacsaw small sharp chisel,micrometre ,balance ,
-requirement enamel,wire coil from transformer ,insulating varnish windings b,wind ratio 320:12=26,66
Manufacture , operation service .
Requireded 25:

-Generator stator rewinding:record ,gas turbine steam turbine, generator,stator bar mechanical dynamic completed rewinding of generator ,removal stator wedge and stator ,slot wall core event ,inspected tested using elcod ,glasky source , confirm material,
- connection ring , installed Serie bronzed induction block Serie ,
Input data unit ,
L=1000 uH requireded index
A=14,5 mm dimension .A
B=2,95 mm dimension B

C=6,7 mm
D= 1,65mm
L=4,7 mm. Slot
G=0,5mm, ur=200 relatute .
-number of turn N=152, effective magnetic path length ,le=18,998,Crosse section.Ae=185547 mm sq,effective core volume , Be =333,347mm cub,peak lumi by cores, IP=0,800A

24. Generator alternator and turbine repair and maintain m,c power generator house 14000 .mm sq .,
80ton to 100toneboverhear crane conditions power up to 373MVAto400MVA , manufacture quality control roles ,
-Electrical power generation minor and major generator .
-design or type of generator stator or rotor general oven houl of any design .
-modification of generator including .
-rotor and stator insulator system up grade rotor and stator cooling system.
-Rotor winding modification rotor and wedge iso .
-completed rewinding of generator .
-minor and major repairs design or type.
Minor and major ,full range of testing and conditions monitoring.
Full range of testing and conditions monitoring.
-on site and off -site balancing fail finding and route cause mechanical power generation repair .
-general overhauls of any design or type of turbine .
-Diagram refurbishment pressure parts . refurbishment and replacement spare.
-reverse engineering and manufacturing of components
-Bearing refurbishment.
-faul find and root cause analyse .
-up grade and maintenances system ,
Scope of work compilation .

-comprehsive project planning quality control and documentation
 completed re blading and . balancing of turbine rotor
-metallurgical investigation ., And report run up down signature testing and conditions monitoring testing and conditions motor ,
-on site rotor repaired service.
Assessment of insulation system,
- insulation resistance,recurrent surge graph (Rsg) testing.
-high voltage testing , assessment of coik retaining volt drop testing ,on site degassing and magnetisation.
-on site stator repair service, assessment of insulation system, polarization index high voltage testing partial, discharge analyses core testing ,Elcid,power flux , engineering improvement

investigation cause.
Faillure design report. VA=E×I..
Requireded:copper
Coil parameters calculator.
-wire diameter: 0,812mm
-number turn:1000turn
-babbin length :25,4mm
-babbin diameter :25,4
Rated DC current, turn wind ,number of winding coil diameter.
Examing generator performance charactere load watt =vxa..
Measure real time,full load kW=total amp×supply voltage 1100.resweve capacity=full load ,kW x 0,25 for percent power ,generatorize,fill ,generator size,full load reserve capacity.
Requireded:
Number of loops: , area of each mm, magnetic field Tesla,time of rotation S,EMF induce .
€:2×π×N×A×B×f×cos(2π×f×t)
€:EMF inductor vole.
N:number of loops dimensionnement
A:area of each loop in mm.
B: magnetic field
f: rotation frequency..
t: time rotation.

Requireded:
-cross sectional area ..mm
Total length of ..
-resistance meter. ....ohm
Resistance ...ohm
Voltage rated Currnt....(v)..
Power at rated current...,.w

-

25.requirement: engineering electrical workers.departement.orientation .wastage
- .life cycle assessment:life cycle analyse is methodology associated commercial products or

<u>services for instance case of manufacture product impact are assessed from row material extraction processing cradle manufacture recycling final disposal.</u>
-Goal and scope definition yes , an inventory analyse yea and impact assessment year , interpretation yes ,
- iso 14040 inventory energiw and material environment aspect iso phase of use data power plan energy control polutionn co2 dioxide , integration system model depletion asssessment commissioning .
-cost of installation system engineering
Cost of the cable selected and cable .total installing operating cable during.
CT=CI+CL,,,,CI=cost installed length cable.
CL= equivenlent the date the installation was purchased ,losses during life ,N year,cost of materials coat product manufacturers margin to determine,
-Economic Conductor size involve, performing calculation neglect voltage dependence losses and find cross section.minimize the cost function,
CT=CI(S)+Io.Io.(R(S).F(N)..where as function of the conductor cross ,Io=maximum load on the cable..
-E.wnwrgy semie conductor conductor cable material magnetic, destruction wastage energy maintence components.

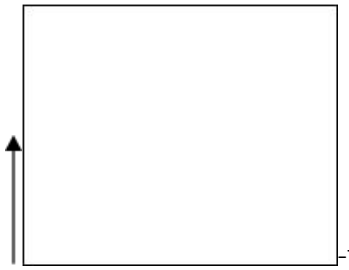
.power Zener diode power rat
Calculation
, input
-V source 23v,vout 32v,IMAX 24ma out put Zener power rating 768 mW, resistance value -375m, resistance power rating -216m,
IZr=OM/V.Z...1w/5,1v..

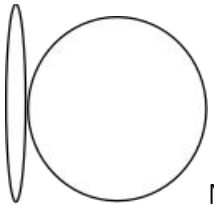
-Calculate battery life ,
Input battery life input capacity rating of battery mAh,
Consumption of devices load current
Output battery life.
Capacity : measured in Amper hours ,the capacity of a battery can usually be found ,
-consumption the average current draw of the electronic device .
-discharge safety the percentage that is not utilise.
Equation, battery life=capacity/consumption x(i-di)
Application :amount of time for battery can supply power to the circuit.
Amp=1c/1s=Q/t,. I=Q/t=900/3×60=5A,
Q=Ixt, ,,I{Q/t,,,Q=Ixt=3Ax90s=270 coulomb,,p=j/c,..xC/t=j/t..
Dimensionnement geometry mass energy destruction.
-dure vie molecules 5ans,traitement dechet ,en combien temp Se degrade in chewingom sac plastique base matiere organique dechet degrade seulement 2semaine,1 metal rouiller integrals

100a1000 Ans pour ,plasty polystea matiere synthetic Egypt..
Conservation energy ,,transformation energy annee Lumiere 360jours ,, destruction material 100-99 force energy destruction recyclage Vieux systeme renouvellable,breaction magnetic induit reaction energetizer.xl..E,q,v
-Electro energie Chauffage..
propos etude conception et fabrication resistance chaffage electrothermique,
-activite: Chauffage,product et service .
Service Devi's material electroteat..

<u>30 requireded: design analysis engineering science energy, engineering chemical, engineering physics biophysics ,science electrical energy</u>
low of conservation of energy, energy mechanical energy (KE+PE).non conservation energie mechanical.
KEi+PEi+Wnc+OEi=KEf+PEf+OEF..
-kinetic energy is KE, work . conservation ,PE work done by non conservation force is Wnc ,

energie are included as OE equation .
-Problem solving strategies ,step 2,determ the system ,step potential energie , conservation equation,
KE1+PEi=KEf+PEf..
Step 4 if you know ,
KEi+PEi+Wnc+OE1=Kef+PEi+OEf,,
-Energy of variouse object and phenomena.
Object phenomenon / energy ING
1ton TNT /4,2×12.10.10.10.10.
-single electron TV beam TV /4.0×10. 10 exp -15.
Energy to break ..
- efficiency: eff = useful energy or work output/total energy input ..
Wout/Eint=
-efficiency of mechanical device and activities coal fire power plant 40%, of the chemical energy in the become usel electrical energy.
60% transformer per phase less useful energy form.


-thermique energy gaz.


Mechanical device efficiency of the human body and mechanical device.
-activity device /efficiency %

Steam engine turbine generator/ 17
Gasoline engines/30
Nuclear power plan /35
Compact fluorescent ligth/20
Gas heater cresid /90
Solar cells/10.
Weight fiting .
-action summary low conservation of energy state that energy is process energy change form.transferred from on system Tom
--when all form energy consider.
KE+PEi+Wnc+CEi=KEf+PEF+PEf+OEf...

Eff=Wout/Ein
-Seleted solutions to problem 1,4×10 exp4..
Equation ΔPEg and ΔKE..
Obtain.
v=√2gh+vo.vo=√2(9,80m/s.s×(20.0)+15m/s/)=24,/s..
4.(a)..24x

Transformation...
F=ma,+mg..
h=m.c.Δt..

Hydraulic hrauelectric turbine conservation water ..thermique metering steam meter cube, ..

Linearity.
KE=1/2.m.v.v kinetic energy kinetic calculating..kinetic calcul.
KE= O,5(30.0kg)x(0,500)
KE=3,75kg..m.m =3,75..
ΔP.E to Δ.pE=m.g.h..
-Δu.p
KEi+PE=KFf+REf..
Transformation energy chemito thermolonger

30.requirement : research industry.and research energy ,,electrical energy electrotechnolgy electromechanic.
Vibration , stability structure
Stability hyperstatic hypostatic pound noued construction stable finuculaire bridge life cycle , Instability Structure energy.electrotechnical.
Phenomenon,control logic.system
Plant engineering electrical science . components campagny design load.

-vibration structure hydraulic pneumatic

Transmission automatic vacuum regulation structure stable stress, indicator logging fault
Mass spring force oscillator .
...MX"+CX"+kx=f(t).
F(t)non zero setup.m is mass c is friction k ,is the springs constant f(t)..Fourie series . periodic functions k,is the springs constant ,f(t).. Fourie series period function ,f(t)=Fo×cos(wt)..
XC=C1.Cos(wot)+C2.sin(wot)...

Wo=√K/m naturel frequency system oscillating,Xp=A.cos.(wt)..

x=co.cos(wot-y.y)+Fo/m(wo.w0-w.w)

-0,5x"+8x=10(cosπ)..x(o)=O, x(o)=o

W=π. Wo=√8/0,5=4. ,Fo=10,m=o,5 ,,

x=C1cos(4t)+c2sin(4t)+20/16-π.π..cosπ.t

-C1=-20/16-π.π..., C2=0,.
X=20/16-π.π..(cos(π.t)-cos(4t)..
-
2.sin(A-B/2).Sin(A+B/2)=cosB-cos ,,
X=20/16-π.π..(2sin(4-π/2).sin (4+π/2.t))
-
XP=At cos(wt)+B+sin(wt).tcos(wt)
-practical resonance.
- w=√w.w-2p.2p...or...x=XC+XP=Xtr+xsp
-coupling factor Piezo electrique.
KP=√25.(fn-fn).fn-fm/fn..

-frequency constant -Nt/No/NL.
Mp
-capacitance - CX (nf):
- static displacement .um...

-static voltage -v .
Resonance frequency Fr (khz).
Dielectric ..
APC material relative dielectric constant KT , dielectric dissipation Curie point c,
-electromechanical coupling factor..
Piezo electric voltage constant 1000vm/ ,young module, titanium,zirconium,quart
,note navy industrial
2×9-11Vac/mil for 840,841,VDc,at khz low field .
-maximum operating temperature
= Curie point 2.standard electric,capacitance+-20%.d33value +20%, frequency+5%>

-30.1..robot dynamic , kinematics and control: .calculation dimensionning
-nomenclature ,operator kinematics, introduction, position ,representation
coordination,cylindrical,co-ordinate,linear velocity,representation of linear
velocity ,Cartesian ,rotation matrics ,active,passive rotation,passive rotation elementary
rotation,representation Euler angles ,axis unit quartersian ,

-angular velocity :

Time derivative of rotation parameter

Time derivative of Euler angles z,x,y

Time derivative of Euler angles x,y,z

Time derivative of Euler angles y,x,z

-generality co-ordinate,

task -space coordinator.

Dynamic classic mechanic .

-Matlab caD..

Operator

-a×b=[a1.a2.a3]×[b1,b2,b3,]=[a]×[b]=[o,a3,a2. -a3,0,a1..a2,a1,o] .[b1.b2.b3.]

Labaled 3d

X(pz=(B¶,z).. Ar=(pcosπ. Psinp)..

Linear vector..

AwB=ER(xR)..XP..

.

--rigid body velocity and acceleration..

Task space co-ordinate corresponding effector manipulator ..

Scarab robot arme..q=(&.B&.$)..

Labaled

-find the forward kinematics for a planar 3 DoF robot arm generalized coordinates are .

..q=(q1,q2,q3).=(&1,&,&3)

And effector position and orientatator.

X€(q)=(x€p(q),x€R(q))..
(X,,€R(q)=(x,z)=(i.isin(q)+l2sin(q1+q2)+l3sin(q1+q2+q3,

Io+l11cos(q1)+l2 cos(q1+q2)+l3 cos (q1+q2+q3)

X€R(q)=X€R(q)=q1+q2+q3...

Programme intelligence artificial..
System robot language machine data

-function : ph get + elu angx z,z from rotation matrix (c)...
% GETEULANGXJZ. Promotion matric (c) extract x.y.z.euler angle frame.
%rotation matrices .
% author ().
X=atan 2(-c(2,3), c(3,3);
Y=atan 2(-c(1,2),c(1,1));
Ph=[x y z];

<u>30.2 requireded: industrial research means planned, research criteal inovation,grow equity component campagny appliance STI stick report</u> equity equipment ,input executive,summary project manufacture
Trade report quality consumer.appliance.
Fridge.tv.stove,ion ketle stick proliferation report project manufacture.report diesels energy metering quality manufacture dtic marketing...
Industrial research high quality components.

30.requirement : research industry.and research energy ,,electrical energy ele

<u>32 requireded: total Change in energy of system</u>
-ΔU= final poten energy , initial potential energy, ΔU=-IΔ×t×V
-(=Δq/Δt)..
Total kinetics energy of the system low conservation,
u= kinetic energy, kinetic energy=I××Δt
Conductor in electric field gradual energy , collision the charge total charges vibration of atome

Conductor heat energy Conductor, P=E/t.
-energy (e) ability to a working done=energy spent power (p)
-meant ..dp./dt . .d / DT (m.v)
Solve equations ...
L.di/DT +R.t.=E 'cosw.t...
dE.dt=0 .. demonstrating pendulum force..energy pandulum U=m.g.h
--dE/DT=-&L/&t. Partial derive l.partial time..
£=P.atct .. forcing function constant t
=Rtcy and forcing function is f(y) {CTD , second order differential ,x(t) , velocity acceleration ,,,DX/DT ..y(t),=Cewt+De-wt

-advanced measurements approach methods ,topics energy measure , discretion verification: advanced and complex energy systems monitoring and control KPI based on integration of the active power apparent power active .

--power average.
Pave=Δw/Δt.. instaneouse.
P=dw/DT..rate of work .
W= PΔ.t power during interval varies
W=int. p.dt work transformer...
P=dw/DT =F vect.×dr/DT= F×(dr vect/DT)
=F vect.×v vect....
--dw=F vect.dr vect=|Fvec||drvec|×cosπ ..
WAB= int f vect .dr ..
Wfr=-f Ind k k..
W Grove AB=-mg (yB-yA)...
W.spring A.B=((-1/2k)(x.xB- exp..

)...
P=dw/DT..... P=dE/DT..
W=int π -π[p.dt

- requireded supplies: engineering electrical energy
how to calculate voltage regulation of distribution line.
- introduction to voltage regulation .
-voltage regulation for 22kv,22kv,33kv overhead,.
-permissible voltage regulation .
Voltage regulation value requireded size capacitor .
-voltage regulation for 11kv22kv,33kv overhead line % voltage regulation.
=(1,06×P×L×Pf)/(LDF×RC×DF)
P -total power in KVA,
L-total length of line from power sending to power receiving in km
-pf- power factor , RC regulation constant (kva-km) per 1% drop , RC=
(KVA.kv×10)/(Rcos$+xsin$)..
LDF=load distribution fonction.
LDF=2 for uniformly distributed load on feeder ,LDF >2 If load is skewed toward the power
toward the power transfo
-maximum voltage regulation at any paint..
Part of distribution system,urban area %,sburba%,
-up to transfo ,2,5. 2,6
-up to service drop ,0,5!
- voltage regulation values voltage variation in 33kv and 11kv feeder limit,
-above 33kv (-) 12,5% to (+) 10%
-up to 33kv (-) 9,0% to (+) 6,0%
- in case is difficulties to achieve the desired voltage rural then ,11,10,433kv..
Distribution transfo place 1110,4..
Requireded and size of capacitor:
Cos$,to cos $2.
- optimum location of capacitor,L=[1-[KVARC/2KVARl)×(2n-1).
L- distance in per unit a long the line from sub station varc ,size of capacitor bank sub total
Voltage rise due to capacitor installation %voltage rise=(kvar(cap)×LxX)/10xv×2.Kva cos
capacitor reactance per phase.,l length of line mile ,v phase to phase voltage in
calculate% voltage regulation of distribution line ,calculate drop and % voltage trail and of 11kv
distribution system.
System have acts dog Conductor (A16/472,G7/1,57)
- current capacity of acsr,
conductor=2050Amp
Resistance=0,2793, reactance=oohm..

Permissible limit of % voltage regulation at trail ..load b
Methods base voltage drop=((√3(Rcos$+Sin$)×1)/(Noof conductor phase x 1000))×lngth of line.
Voltage drop at load A,load current at point A(1)=KW/1,732×volt×pf.
-load current at point
A(1)=1500/1,732X1100x0,8=98amp..
-required no of Conductor ,
2phase =98/205=0,47...
Am =1No
-voltage drop at point.
A=((√3x(Rcos$+xsin$))x no of Conductor phase x 100))×length of line
Voltage drop at point .
A=((1,732x(0,272xo,8+0xo,6)×98×1×1000)×1500)=57volt..
Received and voltage drops=(1100-57)=10943 volt voltage regulator point A= sending volt receiving end volt)×100% voltage regulation at point A (11000-10943)/(20943)×100=o,5

<u>32. Requireded: load current at point B(I)=kW/1,732x volt xpd.</u>
-load current are point B(I)=
1800/1,732×1000×0,8=118Am
-distance from sources=
1500+1800{=3300mwter.
Voltage drop at point B=(√3×(Rcos$+sin$)×1/no of Conductor / phase × 1000)×length of line .
-voltage drop at point B = ((1,732×0,272×0,272×0,8+0×0,6)×98/1×1000)×3300=266volt.
Received end voltage at point B= sending end voltage drop =(1100-266)=10734. % voltage reg at point .
B=.((Sending and volt - received

B=(11000-10737)110734)×100=2,48

-voltage drop at load cload curent at point cc kW 1,73x volt xpd ..
Load current at point c((I) 200/1,732×1000×0,8=13 amp .
Distance from sources.
1500+1800+2000=5300 metre .
√3(Rcos$+sin$)×1/(No of conductor length of line.
-voltage drop at point.
C=((1,732÷(0,272×0,8÷0,6)×98)11×100)×5300=269volt.
- receing and voltage at point .
C=sending end volt-voltage .
Drop =(1100-269)=1073 voltage regulation at point ,c= sending end volt-voltage receiving en

volt at point =
((11000-1073)/10731)×100=2,51%
Interpretation design single line diagram SLD complex projects..
-Mathematics mean power
Harmonic H..mean H=M1(a,b),
Geometry mean G=Mo(a,b)
arithmetic mean a A=M1(a,b)..
Minimum..
M.inf (X1.....xn)=Lim mp (X1...
X)..
Harmonic mean
M-1(X1.....xn=n/1/x...+1/xn
Geometry
Mo(x1...
Xn)=Lim .mp (X1....XP)
...p>O
M-1(X1....xn)=X1+....
Xn/n
M2(X1...xn)=√x1.x2+..xn.xn/n
Cubic mean
M3(X1....xn=3√x1,X1,X1+.....x1.xn./3..
Maximum
M+ inf (X1....xn)=Lim mp(px..

.. single axis arm designed with an ultrasonic motor basic active /passive torque control
- basic servosytem.
Control mechatronics energy.
T(k)=KP[¢d-¢(k)]
Servosytem manipulation , binairy , servomotor angle calculation .
Servo microsecond stage .
Priority encode logic ..

to

34.required engineering electrical faculty

Patronage.
Engineering construction electrical :
Construction principle electrical theory learn . association constructor automobile ,nor vde constructor electrogenmotor
Panel wiring control electrical ,mechatronics , building electrical design installation.
Plaque signal number constructor Manuel hand book previous building plan architecture: building components
Schematic geometric architecture electrical electronics code norm ..
Construct power factor material .heater temperature line load .. inspection find fault rules installation building
License building infrastructure electric municipality planning..
--trade electric engineering manufacturing theory design trading
Workshop workplace component construction skill in job material inspection employee creation engineering architecture.mode emploie operationel basic advanced job applied energy inspection trading relate court low ..trade test certificate licence trade theory job low rules

-engineering electrique foundamental system process low studies integrite analysis investigation design device integrity subject trade and science engineering.electrical engineering analysis component need work fundamental assistance study calcule council association job government.
Summary study case trade Nated and infacture constructor creation subject energy career generation power station, electrotechnolgy.mathematic.science

- requireded: electrotechnic ,electrotechnolgy ,technology electrique,schemat electric,
Generalite Sur un appareillage , introduction , fonction de l 'appareillage ,
Le sectionnnemt ,la command, protection, classification de l'appareil,choix l 'appareillage, caracteristique technique d'un appareillage electrique , tension assigned d'emplloie,(UE), tension assigned de d 'isolement (UI),tension assigned de tenue aux choice uin ,
Courent thermique convention ,l air (lth),courant assigned d 'emploie, pouvoire assigned de Ferme, pouvoire assigne de Ferme, pouvoire,assigner de coupure,durability electrique, protection de l'appareillage ,indice de protection IP ,indice de protection IP,indice de protection ok ,class des material electrique,

-

to

01 Engineering electrical deal science electric electrotastic creation system fundamental electromagnetic power station substation field movement electrostatic dynamic networks nated diplomat n saqa generator transmitted.
-electromechanical application deal technique electrical EIC commission, specifical diplomat symbol circuit power station substation electrotech commission.
-constructor electric deal building electric deal building electric support architecture support.architecture diploma line vector saqa component.
--trade electrical deal diploma workplace worstand certificate power station compagny trade basic.
-tradel labour skill electrical workshop place.
-engineering electrical Nated Isat integrite trade skill power station subject magnetic workplace theory diplomat .
-professional development.
Engineering electrical electrical lab work shop mettering amp wat volt Ave machine power station
Consultant calcuation kWh,metering power station substation conception.
-electrodynamic,charge electrostatic kWh index take by electrical technology,
Calcul , U.I.sin t

Amplitude cinematic charge move electromagnetic reactance.
Engineering electrical trade metering components electrodynamic work.creation electrostatic theory engineering point fixing installation infracturevinfracture
Db box

Diplomat evaluation career total license certificate national trade

LOCATION: Division: Technology Management Services: (Pretoria)

REFERENCES: TMS 36/2019 (1 post)

Generic Requirements:

Applicants must display competency in the post-specific functions of the post;

Be in possession of a Senior Certificate (Grade 12),

Be a SA Citizen,

Be fluent in at least two official languages, of which one must be English;

Be in possession of a valid light motor vehicle driver's licence. Must have no visible tattoo/s when
wearing summer uniform.

Must have no previous convictions or pending criminal/ departmental cases pending.

Applicants will be subjected to a vetting process which will include security screening and fingerprint
verification.

Organizational skills. Computer literacy (MS Word, MS PowerPoint and MS Excel) will serve as an
advantage.

Additional Requirements:

An NQF 6 in Electrical Engineering or NQF 4 certificate or equivalent with minimum 2 years' experience in the field of post or National Technical Certificate level 3 (N3) in the field of Electrical
Engineering light current / telecommunications (Electronics) with minimum 2 years' experience in the
field of post or NQF 3 certificate with a minimum 5 years' experience in the field of the post.

Having successfully completed the following courses Radio Installation, Frequency Modulation

Principles and Basic Electronics (applicable to all applicants except applicants with NQF 6 in Electrical Engineering).

Must be willing to work with heights.

Trade Test in the field of the post and/or certificate in fall arrest / rope rigging will be an added
advantage.

Core Functions:

To conduct repairs, installation, removals and maintenance of radio equipment for the SAPS Radio
Technical Unit.

To do radio infrastructure installations at SAPS Radio High Sites.

To conduct preventative maintenance at SAPS Radio High Sites.

To work and perform operating test equipment (Communication Monitor, Signal Generator, Oscilloscope).

To analyse and trace radio infrastructure faults.

GENERAL:

•Only the official application form (newly developed form is available from all police station, on the SAPS
website www.saps.gov.za and at the SAPS Recruitment offices) will be accepted. All instructions on the
application form must be adhered to and previous criminal convictions must be declared; failure to do so may
result in the rejection of the application. The post particulars and reference number of the post must be
correctly specified on the application form.

•Persons who retired from the Public Service by taking a severance package, early retirement or for medical
reasons, as well as persons with previous convictions, are excluded.

•Comprehensive Curriculum Vitae must be submitted together with the application form.

•Certified copies of an applicant ID document, valid motor vehicle driver's license and all educational
qualification obtained must submitted together with the application form

Bid invitation receiving OTENTIAL SERVICE PROVIDERS ARE ENCOURAGED TO USE THE INDICATED URL LINK FOR THE DOWNLOAD & PRINTING OF SOUTH AFRICAN POLICE SERVICE PDF TENDER DOCUMENTS -

http://www.etenders.gov.za/content/advertised-tenders/ note contractor acceptance e saps scm /maintenance

Contract nr	Description	Published date	Closure date (@11:00)	Bid Document	Yes/not
	APPROVAL OF SERVICE OF AN APPROVED INSPECTION AUTHORITY (AIA) TO PERFORM OCCUPATIONAL EXPOSURE LEVEL SURVRY IN TERMS OF THE OCCUOATIONAL HEALTH AND SAFETY ACT 85 OF 1993 AT THE DIVISION: DETECTIVE AND FORENSIC SERVICES FOR COMPONENTS: CRIMINAL RECORD AND CRIME SCENE MANAGEMENT AND FORENSIC SCIENCE LABORATORY NATIONALLY FOR A PERIOD OF THREE(3) YEARS				
	Contract data				
	service, Maintenance and Repairs - The successful Bidder shall carry out five (5) and six (6) monthly services for the contract period. Thirty				

department of science and innovation socio economic development,

-1 .programme administration technology innovation international cooperation

Gov , city power and St peace college

Programme, exposition science

-2.programme research development support :

St peace college lecture and learner development under planning. Department high Education vs saqa vs qcto,vs seta research resolved time table examination Assessment police , Portfolio documents systems integrity police academic,

-2.1. Purpose: innovation practical and theoretical. science and technology science national trade factor outcome time table trading examination and qualifition framework national diploma n engineering and council trade sector authority , innovation system outcomes empower system subject entry phase learning and lecture teach science exhibition generation technology Assessment police ,and Engineering assessment trade machine and trade control system process project system control evaluation system

2.1.2 knowledge: innovation practical and theoretical trade technology electrical engineering Electrotechnolgy empower value are recreation orientation maximum, value tax , return studies and

Examine electro technology engineering time table assessment

Completed research laniaries system technology value entry lecture exam nated vs. saqa vs qcto linearism system electro technology power fundamental job duty job maximum, job value minimum trade operational, task minim component system,

-Job duty cycle system value : learner lecture framework qualifition and occupation trade job value salary resource human maximum fiscality minimum technology components system : sciences natural system investigation design minimum agreement value job trade module,task minimum ,task minimum service require trading sectors and maximum sectoral electrotechnology trading components

Value financial tax system:

2.2.3: strategies: strategies phasing module tasking curriculum system implantation levels grading lecture

objectivity:

The trading lecture and learning system engineering science electrical subject and technology

electrical ,electro technology ,education technology
System outcome , trading education technology systems power factor demand system education , efficiency system assignment power objectivity module task , maximize inventories psychopedagogie metric system month week of observations learner form test assessment assignment control tpm maintence meeting product control technology goal .

-1.2.3.4: development humain generation: system teaches sector organisations technology rate value maximum rate demand factor admnise value ask required report system value.
-1.2.5.component: trading lecture used company manufacture relate system Industrial Education system intelligence management system information ,education computing control system switch and material support command disposition component manufacturers Numerical time table framework regulatory Education trade relate handbook guideline information and orientation integrative system component handbook relate maintenance update , upgrade system
-1.2.6: basic science infrastructure: implantation of research innovation mission equipment College equipment framework theory practical lab workshop workplace implantation department gov system ,more

Inovation,tax incentives,,
Meeting request

-National energie regulatory of South Africa mandatory electricity piped , invitation me minister tribunal,,

Meeting electrical conformance board design installer regulatority Cox competition b

Meeting salt .dmrg stick ,sale revenue power plant fuel used national treasure sars department of energy mandatory ensure private sector participr in power generation ,
Meet national skill fund,, national research fund ,,
Visa permit

Learner Name (s): __tshingombe tshitadi_____ Grade(s): _____12/ ___, n6 _

School Name: __st peace collge _____

_Region: gauteng _____

Project Title: __the implementation framework circulum knowledge circulum policy engineering planing product improvement contractual agreement with register trainer and consultant engineering electrical and computer science engineering

1.abstract : the implementation framework circulum knowledge circulum policy engineering planing product improvement contractual agreement with register trainer and consultant engineering electrical and computer science engineering static material drawing need discovery Channel partner ways together with the quality plan on being there for system need system generated undergoing next year's and analyse to zero loadshedding or Rental system information recommand theory practice of anticipating dangers social media teach

the innovation define city power municipality government institutes city jhb delivery matter supply public and private urbanization energy electrical ,
And define Eskom entrepreneurs commission delivery society government industrial delivery public private energy electrical commissioner .
.the school and college institutes private public define by Education department teaching learner science engineering apprentice and training and assessment of learner intellectual
-need or problem defined : the research implementation problem need to resolve discovery rural and actually technology innovation industrial to integrate system to standard system knowledge support natural sciences design generated analyze combined sheet from school assessment Portfolio college career outcome Assessment information formative and Summative to workplace workshop mentoring components system to be improved or functionnning to the municipality and entrepreneurs industrial to promovate graduation in workplace.
-research questions:

Ask factor job career outcome transition phase learner phase exhibition phase teach beginning, intermediate,seignor get college junior cadet minim functions graduate chief post generation size industrial , development outcome machine industrial problem industrial maintenance support, manufacture support technical science actual system machine computer system news technology robot science energies need career outcome integration human and material support to resolve demand factor in humans size outcome tendered bid and material resource capacity product integration. to resolve team timeframe operational system month daily diary

2.Purpose: Ask factor job career outcome transition phase learner phase exhibition phase teach beginning, intermediate,seignor get college junior cadet minim functions graduate chief post generation size industrial , development outcome machine industrial problem industrial maintenance support, manufacture support technical science actual system machine computer system news technology robot science energies need career outcome integration human and material support to resolve demand factor in humans size outcome tendered bid and material resource capacity product integration. to resolve team timeframe operational system month daily diary ,
-research time frame :

Project ,importance time frame allocation time table research engineering and science electrical implementation break time load shedding time industrial loss gain resource human material energetic ,time table adaptation system team synchronization, asynchronous system regulation time table periodic alternative or direction energy production system cost metering production human time frame to resolve movement frequency response of team step task project in the structure, resonance learner ,metering learner teacher, resonance learner and system robot actually must be synchronized s

3.Method :

METHOD:

MATERIAL AND EQUIPMENT:

methology specific guidelines assessment formative Summative rebruc,tools assessment learner and teacher ,time table allocation file student file school..workers file employment database file training job and emploie job , humain.

Material stationery information Manuel and automatically system machine laptop computer ,panel system ,design,execise book log book, journal account book, drawing sheet book,office documents wallet book,bank card register office database employment book, need, Engineering electrical material,panel projection permit office workplace register government industrial register social,policy defense security register logistics support, space power. Electrical generation transmission,distribution metering measure tools ,robot it system Port USB , Panel, equipment scaling.office study.

4.Results: nano technology and mining , wath is natechnology , wath are the danger of mining,how is nanotechnology being used to make safe , activity,2,3 ..

-nanotechnology and energyb,where does ours energy come from,non renewable and renewable energy source ,how can nanotechnology help to build better solar panel , activities,1,2,3:..

.nanometre..

- the are used nano technology science very small ,object ,,..

..

..discy, ..

- apparatus , investigation, write an investigation Questions, write a hypotese for your investigation, procedure for the investigation ..make sure that your hypotheses give a clear idea of step you need ,

- connect your equipment so that you have build circuit shown diagram, beginning by including as completed the circuit observe brightness of the ligthbub, now,observe the brightness of the ligthbub with this shorter length,, torch ,wire pencil lead,wire,, now decrease the length pencil lead that has been included in your circuit once , observe the brigth of the ligthbub with this shorter length of pencil lead ,record your observations,

-analyse your data. Assume the brigthness current and resistance do you notice from observations,

-Write a conclusion.

Write a clear conclusion to your investigate..

Activity:

Describe the mining danger ,,

-activity : in group of 5 ,6 learner design and draw a poster showing how nanotechnology is being used to build gas sensors for mines,

- make your poster as clear and colourful as , .
- you teach will assess your using criteria.

- poster is colour and creative , 2 marks,poster shows original idea 2 marks, poster is clearly presented , 2 marks,information on poster is informative. 2

.

5. Conclusion : Engineering it... discovery Computer , training , development and support services to existing or prospective , club house safe creative space to learner aged ,prepares learners for full participation in the 4IR and provide exposure to coding ,robotics ,sebt development, graphic design,3 d design ,2 D and 3 D modelling, animation,video production, basic computing , virtual art , year full time development program 180 unemployment youth aged training including cisco,it Ccma ,ccna security Linux,IoT ,C,C++ , python , essential skills and career readiness, instructor training centre essential ,ccna routing and switching ,ccna security ,ccna cybersecurity operation,to existing or prospective , custome accreditation custome 3,_4 day module ,word,excell,access,Nd power point ms office,speciistr training,it also digital literacy, skills, certiport examination ms office , specifical, delivery fundiy depending learner full standard ,..

University. Undergraduate, how do you conscientise students about 4 in their learning ,reality ,Google self driviy,
- what about the research output research , ..where are you going create new facility .
- complementary roles engineer, design inovate ..role in perspective,
, Career psychological services focus counseling therapy psych education ,career resource ,CV job interview gradust,

Eskom Expo for Young Scientists
RESEARCH PLAN

1. Research Plan Templates for:

1.1. Scientific Investigations Projects/Experiments

1.2. Engineering Type Projects and Computer Science Projects

- For these types of projects,
- a design process is followed according to criteria, to build and test-redesign-retest a prototype/product/solution e.g. a device or a computer code

1.3. Social Sciences Projects

- Social Sciences research involves an objective and systematic method of exploring and analysing human behaviour, social issues and other phenomena. It involves collecting qualitative and/or quantitative data

1.4. Mathematics/Theoretical Projects

- Mathematics projects explore quantity, structure, space and change. Starting with an observation, problem or question, make conjectures/hypotheses, prove your claim using new or existing methods, make valid deductions and test your ideas theoretically. Your reasoning and arguments must be logical

.2.2 SCIENTIFIC INVESTIGATIONS/EXPERIMENTS

NAME:_tshingombe tshitadi_____

PROVISIONAL PROJECT TOPIC:_____

PROVISIONAL EXPO CATEGORY:_____

- NAME : TSHINGOMBE TSHITADI

-PROVISIONAL PROJECT TOPIC: IMPLEMENTATION FRAMEWORK POLICY COLLEGE AND SCHOOL ENGINEERING CIRCULAR ASSESSMENT POLICE EDUCATION TECHNOLOGY TEACH AND TECHNOLOGY ELECTRICAL SUBJECT SCHOOL QUALIFICATION LEVEL IN ENTREPRERSHIP AND INDUSTRIE SOCIETY COMMISSIONING AND GOVERNMENT MUNICIPALITY TEAM TRAINING WORK GRADUATION ENGINEERING TIMEFRAME .ST PEACE COLLEGE SCHOOL ORIENTATION GUIDE MANUEL POLICY

-PROVISIONAL PROJECT EXPO CATEGORY..:

- INTRODUCTION:

2.3 Introduction

2.3.4 Literature review:

?Define concepts/definitions

.What are the benefits/significance of doing this research/who will benefit?

2.3.4 Problem Statement: What problem/issue will you be addressing?

2.2.5 Research question(s):).

Aim: What is the aim/objective of this research project?

2.2.6 Hypothesis:

Variables: List the independent, dependent and the controlled/fixed variables

2.2.7. Method

Materials

Procedurend record the data?

Data analysis: How will you analyse the data?

Ethics

Safety

Time Frames

2.2.8 References

.

Teacher's/Mentor's comments and suggestions:

Teacher's/Mentor's name, signature and date:

ENGINEERING TYPE/COMPUTER SCIENCE PROJECTS

NAME: _____tshingombe

PROVISIONAL PROJECT TOPIC: _____

PROVISIONAL EXPO CATEGORY: _____

- NAME : TSHINGOMBE TSHITADI

-PROVISIONAL PROJECT TOPIC: IMPLEMENTATION FRAMEWORK POLICY COLLEGE AND SCHOOL ENGINEERING CIRCULAR ASSESSMENT POLICE EDUCATION TECHNOLOGY TEACH AND TECHNOLOGY ELECTRICAL SUBJECT SCHOOL QUALIFICATION LEVEL IN ENTREPRERSHIP AND INDUSTRIE SOCIETY COMMISSIONING AND GOVERNMENT MUNICIPALITY TEAM TRAINING WORK GRADUATION ENGINEERING TIMEFRAME .ST PEACE COLLEGE SCHOOL ORIENTATION GUIDE MANUEL POLICY
-PROVISIONAL PROJECT EXPO CATEGORY..:
- INTRODUCTION:

Interview ask

Introduction
?
Need or Problem Defined:
it?
Research question(s): and guides the method section. It must be clear, concise and specific (must not be a Yes or No answer).
Aim:?
Engineering Goals or Design Goals or Algorithms:
Method
Materials: List the materials and equipment you will use.

Procedure: Data analysis: How will you test the prototype/solution and record the results?

Preliminary Designs: Include labelled diagrams (include scale, measurements with units) of the first prototype/solution and descriptions of the design ideas.

Ethics
Safety
If you do not have any potential safety issues, leave section blank.

Time Frames

Poster?

References

Teacher's/Mentor's comments and suggestions:
Research. Career, Eskom, city power municipality , department education, science expo,college institutes school., project

1.RESEARCH PLAN:
- ENGINEERING TYPE,AND SCIENCE COMPUTER
- NAME : TSHINGOMBE TSHITADI

-PROVISIONAL PROJECT TOPIC: IMPLEMENTATION FRAMEWORK POLICY COLLEGE AND SCHOOL ENGINEERING CIRCULAR ASSESSMENT POLICE EDUCATION TECHNOLOGY TEACH AND TECHNOLOGY ELECTRICAL SUBJECT SCHOOL QUALIFICATION LEVEL IN ENTREPRERSHIP AND INDUSTRIE SOCIETY COMMISSIONING AND GOVERNMENT MUNICIPALITY TEAM TRAINING WORK GRADUATION ENGINEERING TIMEFRAME .ST PEACE COLLEGE SCHOOL ORIENTATION GUIDE MANUEL POLICY
-PROVISIONAL PROJECT EXPO CATEGORY..:
- INTRODUCTION:

the innovation define city power municipality government institutes city jhb delivery matter supply public and private urbanization energy electrical ,
And define Eskom entrepreneurs commission delivery society government industrial delivery public private energy electrical commissioner .
.the school and college institutes private public define by Education department teaching learner science engineering apprentice and training and assessment of learner intellectual
-need or problem defined : the research implementation problem need to resolve discovery rural and actually technology innovation industrial to integrate system to standard system knowledge support natural sciences design generated analyze combined sheet from school assessment Portfolio college career outcome Assessment information formative and Summative to workplace workshop mentoring components system to be improved or functionnning to the municipality and entrepreneurs industrial to promovate graduation in workplace.
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-research time frame :
Project ,importance time frame allocation time table research engineering and science electrical implementation break time load shedding time industrial loss gain resource human material energetic ,time table adaptation system team synchronization, asynchronous system

regulation time table periodic alternative or direction energy production system cost metering production human time frame to resolve movement frequency response of team step task project in the structure, resonance learner ,metering learner teacher, resonance learner and system robot actually must be synchronized slot frequency, control loop wizard register access card system movement personal in out robot system entrepreneurs synchronization system. speed level up date need to control by human robot system technology.
-Aim : overview : in the review system career learner induction or error implementation framework regulatory mandatory learner human resource in time time frame must adjustable system and resolve registered system administration standard synchronization and stability adaptor system delay register , model rwin city ,wring commission adapted illegally institutes or college need to training system and adapted in system upgrade update register circular policy engineering planning,
-Engineering goals:
Design , facilities learner Engineering entry model ,years learner up date ,up grade years 2023 to 2018 in college up date and new institutes and news outcyactual tendered job city.
Class model grade 1 to grade 12 level n 1,6 college level , university level ,
N1 to n6, NQF 1,nqfto 3 qualifications framework n engineering, grade occupation certificate seignor council certificate Engineering, category, frequency term 1,2,3,4 semester move file Portofilio assessment student register Poe's docket case indicator job logine , compare scaling,compare ,comtency rating ,
 Synchronous induction learner speed slot intellectual quotient learner entry exhibition, efficiency learner ,average,
Probability learner gate job integrity post learner Portofolio learner award learner , probably learner job equity engineering and electrician daily meeting.
More less .induction error proefficuence more ,
Goal close tendered minimum graduat learner posted salary recruitment post , maintenace poor,
,-algorith achieve , probably.
- METHOD:
MATERIAL AND EQUIPMENT:
methology specific guidelines assessment formative Summative rebruc,tools assessment learner and teacher ,time table allocation file student file school..workers file employment database file training job and emploie job , humain.
Material stationery information Manuel and automatically system machine laptop computer ,panel system ,design,execise book log book, journal account book, drawing sheet book,office documents wallet book,bank card register office database employment book, need, Engineering electrical material,panel projection permit office workplace register government industrial register social,policy defense security register logistics support, space power. Electrical generation transmission,distribution metering measure tools ,robot it system Port USB ,

Panel, equipment scaling.office study.

-PROCEDURE : description
Learner and teach , Education design technology support science ,and enysupport,
- team step task operation activities career,
Relate argument statement button
Operationel preliminary task.method motivation automation ,register system input output student workclass scaling class career class ,yes statement class yes, implementation print and yes , workplace Eskom or city power available learner place yes synchronisation or inspection department education or labour gov yes adapted system accountability yes restore file system yes , , relay delay yes compare yes test control loops system yes flip file equity and statement post yes, teach system yes up date course lecons activity yes compare resolution certificate yes occupation yes qualifications yes compare systeme, questions custome system ask resolve yes meet yes training ask component framework yes activate yes implementation yes system restore maintence support system,
Data systems collect and memorise award.
-ETHIC : completed safety.
Circulum policy framework regulatority,quality council trade council engineering, circulum policy, Education regulation regularity irregularite material fault default, insurance quality , Health injury or health time frame synchronisation,asynchronous learner , network transmission,generation distribution system synchrone,real time , images time frame safety,time frame framework stability learner , induction learner error learner outcom no meeting or learner gate damage system or break time table material stationery workplace college affect workplace industrial and municipality breakdown job injury body or robot system industrial registration move inactive receive message or not send or not incomplete,support no survey real no arrival place asynchronous

2.LITERATURE REVIEW

-time frame : project work plan
Plan orientation industrial and supervision.
. orientation industrial : schedule project shift days night
Management supervisor
Humain resource
Management system information
Legal practice

Date :
State,:
post :

- teacher ' mentor comment and suggestion:

-3. ABSTRACT: the implementation framework circulum knowledge circulum policy engineering planing product improvement contractual agreement with register trainer and consultant engineering electrical and computer science engineering static material drawing need discovery Channel partner ways together with the quality plan on being there for system need system generated undergoing next year's and analyse to zero loadshedding or Rental system information recommand theory practice of anticipating dangers social media teach,
-Name : tshingombe
- school name : St peace college.
- grade : 12/ level 6,n 6
Region Gauteng.
- PROJECT TITLE: IMPLEMENTATION
-ABSTRACT :
-PURPOSE:
-METHODE:.

-project management: building for scientific mentor, school,

- views school attending,
Project submitted.
- customer used.
- application award certificate .
Grade expose youth.
- project creating .
- school management projects
Development companies.
- social, science.
-agricuture animal, prody agriculture,
Biomedical chemistry analysis,
- computer data management data science network,St earth science , atmosphere ,climate science,energy, productivity, engineering, biomedical, engineering chemistry, math, algebraic ,plant sciy, physics, astronomy,science,matter,science ,matter ,optic,

-Types of project: scientific investigation: reseat questions and a hypotese, observations and ,
- it involves Colle ,
- engineering computer design , process , according,criteria,build test redesign,retest proto,

-mathrmatic, theoretical,
Print explot,
- quantity hypothy
- creative identify what.
- interest focus specii topic
- determy significant, value.
Topics literature review.
Creating ,ethic ,response research plan ,
Project book,
Take pictures.

2. Teacher mentor name

Teach engineering/ and Education technology.
News are Cree city and commission

Teach engineering youth
Reflections daily
Career mentor
-lesson plan:
-Nano technology and water
What is nanotechnology,
How small arbobject nano technology,
Where does our water come from ,
How can nanotechnology make safe to drink.
Activity 1,2,3 extension activity.

, -nano technology and mining , wath is natechnology , wath are the danger of mining,how is nanotechnology being used to make safe , activity,2,3 ..
-nanotechnology and energyb,where does ours energy come from,non renewable and renewable energy source ,how can nanotechnology help to build better solar panel , activities,1,2,3:..
.nanometre..
- the are used nano technology science very small ,object ,,..
..
..discy, ..
- apparatus , investigation, write an investigation Questions, write a hypotese for your investigation, procedure for the investigation ..make sure that your hypotheses give a clear idea of step you need ,
- connect your equipment so that you have build circuit shown diagram, beginning by including as completed the circuit observe brightness of the ligthbub, now,observe the brightness of the ligthbub with this shorter length,, torch ,wire pencil lead,wire,, now decrease the length pencil lead that has been included in your circuit once , observe the brigth of the ligthbub with this shorter length of pencil lead ,record your observations,
-analyse your data. Assume the brigthness current and resistance do you notice
from observations,
-Write a conclusion.
Write a clear conclusion to your investigate..
Activity:
Describe the mining danger ,,

-activity : in group of 5 ,6 learner design and draw a poster showing how nanotechnology is being used to build gas sensors for mines,
- make your poster as clear and colourful as , .
- you teach will assess your using criteria.
- poster is colour and creative , 2 marks,poster shows original idea 2 marks, poster is clearly presented , 2 marks,information on poster is informative. 2 marks, group work learner were included 2marks ,total 10 marks.
2.how to build yourself a bright technical future.
- considering a technical career,..
- let s get down to work ,
- how do I pay for ..
Technical and artisanal not so low skilled job fact skilled,
Revolution age material age skill..
Myth and facts about technical careers .
Myth choosing a technical course will lead a low paying job , career regards status compare,gate stuck on your career ,technical career are not for women ,is dirth work,there is not room for creativity in technical career
Fact : a well qualified technicians or artisan is high demand and will earn good salary , need RSA job technical low, women do justas these career, workplace need clean
, Engineering challenge are practical problem and many need creation nthar where qualifirv,, .are you fascinated by how something,piece make it up together,do you prefer to make things instead of reading aboutg ides ,doubyou enjoy solving puzzles and problem,does working in team make happy ,would you like to run your business ones day a career as artisan or technicia ,, mechanitechnique , electrical,civilengineering technologist
, Let see what you are good at , it can difficult to decide what your are good at what career you want doing is to use a theory designed, six broad type,
realistic,investigative,artistic ,social,entreprise, conversation, occupation personel,
-Are you realistic,are you pracal, CA you fix electrical things,do like explore machine, wath score
-are you investigative , are inquisitive ,can you things abstractly, do you like to explore ides,,analytical solve math problem use computer wath score,
- are you artistic are you creative , sketch draw or paint all ,solve problem in original way, intituive ,use intutii.read stories,play and poetry,imagine,,are you social are you friend can you teach or train other,do like to use social or interpersonal,are you enterprises,are you self confidence,star project ,do you like to make that affect,
- so what now ,how do you get there ,
Registered Education institut NQF qualifications.
Career career Pathways, ,school need subject ,wath exactly the Engineering technology field ,electrical,career pet for part..
- birthday planetarium, science activity, ,erupting apples, planetarium show,science show, graphite circuit

Climbing wall package,
Subject in the national curriculum statement grade ,10-13..
Learning field ,elective subject, you need to have selected subject, subject refer to the ,
-comulsory subject ,home language n,first language,pure math ,
Human social studies ,physical computer, business comeerce managent ,service manufacture eny, design technology, electrical technology,eny graphics design,mecanic

Engineering it... discovery Computer , training , development and support services to existing or prospective , club house safe creative space to learner aged ,prepares learners for full participation in the 4IR and provide exposure to coding ,robotics ,sebt development, graphic design,3 d design ,2 D and 3 D modelling, animation,video production, basic computing , virtual art , year full time development program 180 unemployment youth aged training including cisco,it Ccma ,ccna security Linux,IoT ,C,C++ , python , essential skills and career readiness, instructor training centre essential ,ccna routing and switching ,ccna security ,ccna cybersecurity operation,to existing or prospective , custome accreditation custome 3,_4 day module ,word,excell,access,Nd power point ms office,speciistr training,it also digital literacy, skills, certiport examination ms office , specifical, delivery fundiy depending learner full standard ,..

University. Undergraduate, how do you conscientise students about 4 in their
learning ,reality ,Google self driviy,
- what about the research output research , ..where are you going create new facility .
- complementary roles engineer, design inovate ..role in perspective,
, Career psychological services focus counseling therapy psych education ,career resource ,CV job interview gradust,

to

purpose: 3 ,,phase synchronous machine an electromechanic energy conversion device operate speed of rotating magnetic field , synchronous machine ,bases energy, synchronisation generator, , NS = 120f/ p , number of poles the machine ,
Work.principlr,
-key features, synchronous motor do not starting self , synchronous machine double excited machine because it requires two input supplies ones stator , synchronous machine,operate at constant speed, called , syncy generator can produce voltage magnitude ,machine lagging,leading unit, syncy motor voltage : equation of synchronous motor,
V =En+Is(Ra+jxs)., - v = voltage Police ,En back end , I a armature current ,Ra armature resit, resultant voltage difft between the voltage applied V,and back EMF, Internal angle, ER, and tan @= X's/Ra..,back EMF generated , En= ka.alpha,NS..
En=v normal excitation, logging power factor, input power : input power synchy motor is given pin = v.Ia.cos ,,,pin = √3.v.L.I cos ,where ,, .mechanic power in motor ,Pm=Eb.Ia.cos (a-alpha) ,,,Pm= Pin - Is.Ra..Pin= √3.VL.I.L cos ..is load angle.gross torque,synchry,speed , stepper motor ,B= Ns-Nr/NsxNr)*360..step angle of rotation ,ms = number of stator , resolution of stepper motor , , loady regulation= change output,no load , output volt,, fault calcule breaker busbare ,IB= , I/X's=1/x+1/x..
- Implementation and stability inspection, cycle of training ,step take long time
- psychomotor : and physical requirements of a job analysis survey rate the functionalite requirements of job rating class ,job analysis,process, resultat process , resultating primary resultat job session news , category data, work ,instruction , function,analyse ,PC to collect data and draw , construction job tools ,build task tools up data ,,
- function in the real world introduction student to function ,function machine, functionalite machine easy ngrap, machine input goes same thing happened rules ,input predict output determine the input, input , metaphor by setting large cardbox machine mystery rules ,teacher student can create rules teacher created spread sheet machine,,,,
-Synchronous system asynchronous effect .phase transition
Asynchron 3 space 90,120 , wave ,,
-understand the gradient function slope slip tangent point derivative ,vector function Probly calcul gradient loss function,,gradient scalar function ,have two function partial derivatives,
-Maintenance during operation abnormal yes, breakdown yes, yes scheduling, order , maintence, database yes,yes period, mid term maintence scheduled, monthly equimt inspection ,.
Implementation leader Education problem counter mesirw , trainer, equipment specific,inspection educay yes,inspection trait yes,self , leader Education yes,
- factory dry battery process, phenomenon batteries failling , revolving table, description loss

balance,

-implementation ,system analogy,I/0 control investy application of embedded control controller to real time control algorithm input analogy output implo a closed loop ,how feedback use linearized ,non linear process and resultat in zero steddy ,
generate pwm outputs to implent variable motor ,supply voltage, Implementation a tachometer operational using pic 32 timer ,develop the CP program code to Implementation a pi controller moving average digital filter , monitoring display, reading embedded mechatron ,basic circuit pin microship pic , microprocessor, hardware basy trainer board workstation ,PC running windows,MC1 Linus ,12 v motor switch ,5 v,4A DC power supply,software ,mplabx plib cross , Project takeaway how read Nalog compare implent a pwu capture period measure , fundamental digital,open loop and closed ,process control ,
- fundamental concept ,unit introduction process electromechanic I/0 , automate process control engineering deal,automai process,open loop, DC motor speed counter record , Transfer functy magnitude response,phase shift ..

-Synchronous , .time period phase move transition job work
vibration robotics system
Mass spring force oscillator ...
Function , mx''+cx''+kx=f(t)..non zero setui mass friction k is the spring constant,f(t), Fourie series periodic function, f(t)= for.cos(wt).
- resonay, control nature frequency, control logic ,circuit ,
- frequency constant , capacitance,static displaced,static voltat resonance ,piezoelectric voltage constant .

Synchronouse robot dynamic, kinematics and control ,nomencenture ,operator , kinematics, introduction position represent coordinator , cylindrical, coordination,linear velot,reprensation velocity Cartesian ,rotation mayris ,active ,passive rotation passive rotation, elementary

rotation,representation Euler angles, unit , time derivatives of rotation ,generality coordination ,mat lab ,rigid body velocity and acceleration,task space ,co-ordinate corresponding effect, f
- forward kinematics for planar robot ,are and effector ppsity, function rotation matrix c
-% GETULANG XJZ from option matricr (c) extract x ,yyz Euler angler from % rotation matrices,% ,author,
- xy = a tan 2.(c(2,3),((3,3));
Y=atan 2 (c(1,3),sqrt((1,1)^2+(1,2),c(1,1)
Ph=[x,y,z]
Lifting job ,,,

Synchronouse.
Low of conservation of energy, mechanical energy (kE+PE), conservation, energie.
KEi+PEi+ wnc+OE= kEf+PEF+ Oef
Kinetic eny is key work conservation, PE, done by conservation forct energy are included, equation, problem,step 1. Determine the system,step potential energy conservation,KEi+PEi=KEf+PEf, step step enerivariouse ,object phenom.efficience,
Eff= useful energy or work out/ total energy input....
-Total change in energy of systu,
Δu=Δq(v2-v1),, Δu=IΔtv (I=Δa/Δt)
Total kinetic energy of system energie of system conservation,u = kinetic t, kinetic t=i.vΔt.conductor electric field greadui eneri,colliu t charge total charge vibrat of Tom heat energy conductorP=E/t..
Energy ability work done =energy spent power what meant DP/St, f= dp/ St, St/ St (m.v) , solv equation ,,L.di/St+RT=E°coswt..dE.dt=o demonstrate pendulum force u= m.gh
dE/St>forcing constant function..

-eskom smart meter infrast up grade programme relit supply empower them control consumer,meter consultation process meeting block tariff,meter renewable,customer interface prepay,remote .information meter5,,
-advance measure approach methode, complex energy systems monitoring and control kpi,based on integration of based of active power ..

Lesson teach note:

What's is nanotechnology: is NM one billion the length of matter to pir perspective, diameter average bacty 2500nm long material 100nm nano matert,,,nono scat material, involved the product manipulation nanoscale material products ,nanosciet consists discot and character,
-activity fields nanotechnology, @0 years research plan research ...
- the electronics industry,wath is distinct need between electrical appliances and electronics electrical appliances and t flow of charged particles electronics in this metal conductor copper wire ,found electrical cord home appliances non metallt conductor ketler ,electron ,non metallic conductor semiconductor found cellphone..
-nanoelectronics current and future applications.
- origins of nanoelectronics: ,100 atoms ,
- computer hips semiconductor industry:
CPU ,central pro easing units found computer, transistors embedded in silicon, calculatioy per second required keep ,replaced out data technology tubes 1960 s , accordiy to Moore's low named after ,PC transistor ,45 NM ,process 47 million nanoscy transistor distrt accross 26 mm ,compone computer,,
Components found quick retrial storage data volaty data abscen d use carbon nanotubes , computer switch data retention,data recovery during power cuts,

- molecular electronics: decrease in size components molecular emerge task performance ,capacitors in electronics device ,capacitor store information, molecular been investigated act incredibly single electron .
- organic light emitting diodes OLEDs : television and computer monitor ,electronic device Thea days particularly handled device mp3 player ,ligth emirtur ,OLED organic light. Emitting diode 100nm packed betwt conducting film called electront film voltage causes energy ,compare OLED ,screen film, product,
- touch screen : technology as found in many table ,palm computer ,smart phones and news laptop,works , digital signal to control device interwar , layering of conductive film of indium tri oxide Ito , which conductor relay the ,x- y coordonne to processing components of the device ,smart ,ITO , technology.
1 nanowire can produced to high conductive transparent subnano wire network allowt hegher screen brightness ,with option of producing flexible screen Ito film,
- improvement batteries:
Devet in battery,lio batteries ,smart phone ..
- risk and safety issue: unique physicochemical properties of nanomaterial electronics industry , safety humait,nano party,microsct,mass ratio risk asst , hazardous nanopt,national occupation health ,incorporate.
- key issue to consider : renewable water energy have lagged ,, chip manufacture capabilities.
- future risk assessment:
The future nanotechnology in the electronics industry:
- conductor,:material that can transmit heat ligth ,electrical charge in case electrical conductor

electrical conductivity mesure of electrical current move through material it can see. As opposite of resistance,
- semi conductor : a material that can conduct electricity.under specifical circulum voltage current flowing through common material .
- led technologie: ligth emitting diode are semie conductor device emit light as current from anode to cathode .to cathode energy from of photon ,is release electron through the led device bprocess called electroluminescence,
- transistor , semiconductor terminal current flowi between b,
-capacitor ,an electronic components store electrical charge consiste two conductive plate separate ,
- electrodes , the anode is the electrode oxidation reaction takes place reduce,
- graphene. Two dimensional one atom carbon atom bonded hexagonal the crystalline alloyrip structure a pure element ,pencit lead ,carbon nanotubes,hallow cylinder consistent,nested comprised of carbon atoms ,spherical carbon fulleren composed entirely carbon atom in bKk shapp also called buckbakk and buckmnjsterful,they commonly consist 60 or 79 carbon ,physicJ property , of substance relating to both it's physical chemical.

-Metering screen ,ITC manufacture nanotechnology transmission component automate ,, Synchronouse system , synchronous intelligence it ,

Teacher’s/Mentor’s name, signature and date:

SOCIAL SCIENCES PROJECTS

NAME: _____tshingombe tshitadi

PROVISIONAL PROJECT TOPIC:

PROVISIONAL EXPO CATEGORY:

Delete all guidelines under the following headings once you have completed your Research Plan

Introduction

?

Problem Statement: What problem(s)/issue will you be addressing/exploring? Write the research question(s) or problem statement.

Research question(s): Question).

Aim: What is the aim/objective of this research project?

Hypothesis:

Variables:

Method

Procedure:

tables, graphs?

Ethics

Safety

If you do not have any potential safety issues, leave section blank.

Time Frames

References

Teacher’s/Mentor’s comments and suggestions:

<tshingombefiston@gmail.com> Aug 28, 2023, 8:09 PM (6 days ago)

to Support

Project social..

1.

2. Social investigation : science natural

Support social creation and recreation orientation circulum Assessment police social enterprise entrepreneurs sector products resource energie electrical commissioner ,training support system circulum , synchronouse system social machinery social safety government system in the time framework regulatority circulum sector education grade and level in the job system , development sub sectorial system system social worker synchronouse

Social worker public work system basic advanced must synchronouse with social system , labour worker OSHA safety society synchronouse with Commission electrical engineering worker data,

3.

3.1Teacher mentor :social education

Social education labour and land reform system , organisation entrepreneurs and humain resource system education system asynchronous,system class society ,grade society science mass media society work classes.

- families class work project, organisation non governmental social education entrepreneurs workers sub sector self employed self business was illegal or fraudulent system in normale system entreprise government system asynchron, need to educate social media by training for to synchronouse,

-3.2

lesson system social media support rural to teach and non gov,

-file worker, size years, skill development,size ,class skill ,model frequency ,means , value compared ,size social skill or semie skill grade , qualifications employment years , normal ,criteria choice guidelines normal, ,,report learner ,report job normal work labour synchronouse , report job pay hr give normal conditions , . Calcul system find balance merge social .good job

- 1..mathematic investigation ,

Framework regulation circulum policy for mathematics resolve ,

problem for science discovery system

Equation computing system equation, algebraic logic , analyse system mathematics find problem or concept ,proof existence natural system undercover real problem in natural

System exper or artificial intelligence or language reason calcul,

Synchronouse system to find more equation algebraic ,complex numbers master system deviations system ,equation find mathematics number master skill knowledge,proof existence of system function or gradient function ,function was real on distribution and transmission power ,was real system that was equation remarks for master number , mensuration system equation and compare slop of number deviation ,angle period time volatility time loss time break ,that was equation , trigonometry and geometric pattern number , statistics and probability to find on projectsion number real and case reason for linear systems..

1.2Teacher mentoring:

Teacher education,system mathematics education subject lesson circulum, apply skill compilation language logic intelligence or robot system capacity of synchronouse system, mastering skill number use instrumental take measurements rule and measure instrument for understanding

Lesson plan orthopedafic projection planing , synchronouse ,system scale analyse geomatic geodesis ,vector equation quadratic linear synchronouse mensuration equation ,

Activities ,system resolve plan diagram current sinusoidal wave form angular system projection

orthopedics activities,design form , computer language wave,

1.science natural chemistry physics:

...

- project

Investigation: natural science: earth moon sun planets system quantum years ligthning years days start day end of day system ergonomic design

Natural teach discovery

science engineering

Investigation , physical and chemical,

Engineering ,computer information technology, mathematics mental calculation

agronomical grade class agreement , grade geotechnical grade class years geography engineering,mining investigation grade class matter

Investigation, science class matter elevation matter atomic cycle ,Watters cycle , recyclage matter ,investigation find matter chemical composition matter ,solid ,GAZ liquid state , molecular ion electronics development skill materials ,charge dischage movement find current electrical mining agreement , degradation material and graduation material system , synchronouse material system Earth system cycle life skills ,,..

Chemical. Size system difficulties to synchronouse for reason challenging life and disorder order natural system undercover real problem, industrustriel

-Physical state matter Liquide to GAZ,GAZ solde ,solide to GAZ process

Synchronouse phase transition matter,

Electricity man's mecanic,

- electrostatic ,electrocinetic, electrodynamic, electromagnetic, static,dynamic ,cinematic ,

Electrostatic investigation phase system matter transformation ,force electrostatic transition electrodynamic phase to electrodynamic current to resistance resistance to field magnetic,,force mass phase ,generation phased to transform phased , system skill , transmission , distribution system synchronouse real time ion matterial speed celerity transmission ,km/s

- teaching education ,science natural investigation , psychosocial psycho science development system natural task system computing file system Education technology system science didacic system framework regulator,

Teaching phase transition phase synchronouse system development , chemical sciences ,,material phase material transformation plastic ,elastic deformation material ,, computer system matterial decomposition chemical atomic spray eating phase GAZ generation force cycle synchronouse system generation to system transmission and distribution Metering, ,atomic spray heater product coil consumption phase cycle generation system going ,to transmission ionique chemical computer system grade support to grade transformation synchro reactance system , electrostatic electrodynamic magnetic synchronouse to wave to distribution system ,,, resistance way system for material recyclage, phase material strengths,,

t

tshingombe fiston <tshingombefiston@gmail.com> Thu, Sep 7, 3:18 PM (12 days ago)

to Support, TSHINGOMBEKB, me

Teacher mentor: safety security accreditation teach traffic police

-trade vs learner vocational , accreditation safety security safe,road teacher secondary safe road usage, foundation for road safety meaningful maturity existence self control technology and responsibilities creation genesis magniful machine sense of responsibility and Education

task of the school compiling, traffic training in the secondary school, traffic situation child youth road, orientation youthful level abuse, among legislation low vehicle element natural insects phylogenetic,pretestimonal,

-road safety education and Education part perspective stretches maturity Education situation situation child rod block, chorence,psycho pedagic perspective magniful questionaire secondary school child learn in the road safety education situation always leave among others think fact, concept compare matter interpretation emotional fluctuations inferior child master road available of book,

-fundamental relationship understand authority between teacher and child teacher and parent risk child freedom resposable,

-A social pedagogy perpespe tive road safety education always take place social situations secondary child creation communication gap, between teacher parent.

-didactic perpespe tive in design diffential road safety pedagogy diary situation teacher has keep following learning action the subject matter must be interested practical, experience involved.

-An orthopedagogic and orthodidaction problem study learner is to indentify secondary purple mine whether hold implications safety.

-child basic characteristics aquerie methodology of road Education maturity aspect lesson discuss holding gather,

-the goal traffic education, traffic lesson objectivity clear identify basic, the learning on skill or interpretation problem setting and resolve challenge course advantage grouped pupils activity part in the lesson understand manipulation,

-course of the lesson actualization Pre - knowledge safety lesson pupile have knowledge road safety pupile.

-teacher discuse, unlocked of new content basic functions pupile may expected road, groups discuss in greater class arrangements variation place criteria judging success group discussion example,ex lesson a telling subject STD,6 time, Education object lesson to explain pedestrian behaviour the learning objectives

-schematic present of Education and teaching, teaching and software and hardware visual.

-education qualify audio visual teaching knowledge,

-safe driving and elementary knowledge of motor vehicles,

-pupils car owners car motor complicated mechanism dangerous master to supply of in sight

those of driver, gravity,parking down ,centre inertie, energie,collision friction force impact counter determiner force impact limitation mental emotional film understand,,

-conduct assessment police,driving asssessment police traffic on learning assessment police ways on policy on assessment police engineering way to manager learner in management system police vehicle information learner transport information circulum learner

In phase period synchronouse system and asynchronous system phase movement in out file compilation

Management learner to manage information system IMS, securite, student information system advantage and consideration,role management information systems in Education and in police or Industrial, engagement power cloud base schools management system,

TSHINGOMBEKB TSHITADI Wed, Aug 30, 7:39 PM (4 days ago)

tshingombe fiston <tshingombefiston@gmail.com> Mon, Sep 18, 3:39 PM (22 hours ago)

to Support, TSHINGOMBEKB, me

Engineering science: Education

Teacher's/Mentor's name, signature and date:

Social education, education environment ,geographic life cycle industrial recycle synchronise system biogenes system hygiene system

project expo science

Support <support@exposcience.co.za> Tue, Aug 29, 2023 at 8:59 AM

To: tshingombe fiston <tshingombefiston@gmail.com>

Good day

Did you participate with the same project at a regional expo?

Expo Team

63 Reier Road|Atlasville|Boksburg|Gauteng|1459|South Africa

T: +27 11 894 1365 |F2M:+27 866243127
www.exposcience.co.za

Re: Documents wallet Portofilio,office Engineering project order management appointment project file order sale campagny meting tbrigade,edutech psscm... agenda office .PC safety wallet documents financial office

-1. Purpose: documents wallet Portofilio , documents systeme info., project appointment office Poste

Agendas office PC safety wallet document wether documents,data base , documents network research office appointment.

- project month ,order document . Order screen. . Statement documents.

1.1.Purpose: documents case book .booking documents

, financial information documents office ,

-Office document

-post documents,

--Poste wallet easy documents Poste

---office ,post bank , archfile office document ,

Docket..

-Documents arch file

-Documents stationery document

-Documents office

-Documents database system .

-Documents bookeping sale buy ,

-document library bibliotech.,
- documents,
.--- engineering creation document .,
Post document office appointment submission close ,
-Price documents, price close tendered ---Poste value bid posted wallpaper,
Minimum required Poste tendered
Spreadsheet,office PowerPoint, -documents ,office post address documents
Relyan documents,
-Documents memorandum access documents Poste office , documents reading , documents ,
Project posted
Appointment post documents wallet report agendas
Project
- documents processing input output
Wallet project, management

- documents screen radiographic documents scanographic documents photographic document image documents artistic valeur attributes document pixel coulor , documents
Document monument magazine monaitaitarist ,tableur course, documents,
Documents note ecriture

3.purpose . documents wallet Portofilio evidence,,
-Documents wallet registration form appointment office Poste wallet easy.
- register database documents wallet
Programmation office register document.
-Database employment documents wallet .
-Office document wallet Portofilio.
Information recruitment documents wallet information employment system
Database office d base qbasic visual basic office COBOL .
- office project database documents wallet .
Stationery document wallet office information handing Manuel system
-script hand project documentation
-arch file ,office folder desk information table time table task operationel system case paint case book library office ,
-office size .mass. meter square area
- casebook, rerwiten framework tools form assessment formal Summative office ,

-Tools frame text page , stationery design printer sign industrial papper standard.
-Tools paint case design ,
Office automation machine system la guage conversation convert reader PC and environmental PC printer system recruit machine database system project , documents wallet arch file database electronic memory wallet ,
Documents wallet information employment system specific, responsible,,
-Documents wallet bank account database automatic ATM ,printer bank ,stamp teller stamp , statement,check database system , account books library bank ISBN order book bank order project book bank wallet , employment salary
Record book customer reviews, customer record registration ID number system information, Documents wallet Portofilio job career emploie,
- database emploie system entry and dabase outcom up grade ,up database system project employment opportunities, ID
- ID registration form record form entry ,form exhibition,form move , form period form years value database emploie
Emploie record training job graduation,job training post advertised documents wallet resource humain , personel
- ID registration form customer recording training custome entry exhibition, database emploie graduation job post customer sale reward award customer ID wallet documents Portofilio, officer
- bank account statement bank customer clearence cost amanded correction reward discount I'd customer deregister penalty, I'd customer record emprissonement labour work I'd cost years , system document wallet office information handing,

- program logic control customer ,logic system custome I'd , programme language machine customer database system document wallet Portofilio, I'd
- wallet I'd trainer, course job ruling job duty job post job weekend job . Wallet account e wallet easy pay system.
-Print I'd framework, print I'd information,,print post ponent I'd ,print job duty post rosta,print task operation print salary day , prive over time ,printed provide fund ,print tax job revenue emploie post ,print compensation award job , print insurance job ,print data dol registration labour, print conciliation arbritatiin ruling job conduct job day 90 day years progress conduct , misconduct,dismissal award job,print holiday job ,over time ,print pension job ,print intellectual property job register ,printed social insurance job security job , printing policy job record database system wallet accountability systeme, print order case power attorney debate creditor legal job , printed training record job authority job skill development job, training certificate in progress ,award certificate,printed agreement settlement job , print documents grand total wallet statement salary emploie resource emploie,humain ,material visa printed code , registration, database system providing fund , earned award printed ,
Convert

-Office wallet Portofilio Poste office documents wallet resultat ,re posted , disappointed documents printed , rejected documents, expired documents posted up date documents,up grade documents wallet Portofilio employment and custome record , licensing database.
,- design project office to office travel office information system, management information systems documents, ,
- design projects inovation management system conduct process following database maintenace wallet account account posted recruit machine database maintenace repaired , intelligence systems rebuild office , rebuild Poste re posted policy meeting, reprint documents review document support, wallet account,

Booking: filing documents posted wallet account documents booking training records ,

-office travel,,office cad corol drawing ..project office documents wallet engineering drawing .line work , planing work, planning jobs, systemWallet account dr

12.Engineering: electrical

1. Purpose documents

9.purpose : documents wallet,office,
Training customer office record , documents,office,
Training customer,and training student university trading up date upr grade student information system,up grade connexion system,
9.1Purpose storage , office genie counseling,genie soft ward genie hard ward ,, safety security policy office counsultant jurisdiction
Documents submitted
Assessment and re assessment peer self group information technology intelligence , technology
Technical PC vs science computer vs qualifition insurance information

-help memory pilot math information vs campus numerical box ,math info,news technologie ms word ms help memory copying syllabus training Unix Google
Intelligence artificial genie logiciel , input technology ms office creation news technologie help memory use for ms treatment technologie input output system expert intelligence capable resource human capacity not it includes mathematics algorithm ,,
- calcul arborith , topographic topologies aerveur , intelligence robot automation science language science language science computer science language ,science mathematics chimic physics stereo chimic physics synthesis and , Polytechnic electronic information technicien ,,no ITC it is include work topic it faculty option intelligence artificial and genie logiciel ,
- pilot lecture pilote fly driver disc memory network navigation,
Mathematics sacrifice workplace visuel basic ,
- honesty intellectual library pilot ask questions training PC cyber ,training research ,x vs y procedure create page create algorithm arborith ,step number phase fine creation page , button exportation language literacy ms word , creation find studies habillement ms word creatt find studies caractere address vs medecine mycine bio algorithm ,science Polytech algorithm
-retetion office ,button cyber button command ,do's vs algorithm procedure medicine to mutch work office contii algorithm is vs algorithm for students ,
- subject theory vs for laboratory training work , literature 'creat visual basic office protection documents client terminal all letter memory ,
- algorithm initial procedure select , operationel insert button, click operationel,
- information processy vs Computer office , financial Computer ms , window theories safety policy theory vs ,technical PC ,vs science , PC ITC theory create cover page letter folder create financial fibre optics create xompui lettre CVS ,create ms word processing marketing processing asj , buttons ,create for data data base office ,intellectual ,oms algorithm PC ,technical mathematics science PLC ,robot Unix,
-info process vs computia vs management system information business PC ,admnistry PC theory cover ,page office traine power point acrob converse,
- mathematics info comptabilite invention creation plan comptable code binaire calcul, vectorial code binaire 'calcul vectorial dimensionnement algorithm mathematics financial invention plan financial savant Gestion ,
-arm calculteice commercial, invention formuler mathematics function grand droit ,
- invention: ax+ by+c. functionalite logiciel rigth autocad cad ,vector financial functionalite value adddiatribution ITC ,scatter robot geodesie projection ,invention mathematics ,savant mathematics autocad,memoire mathematics
-inventiin mathematics info science computia mathematics exchange call cash nothing financial functionalite,
- invention mathematics series sequence integrally ,x =3 ,if y=4 else the x,y co - ordinal scator ,z = matric information equation ,x+y = 0 Fortran sum limit x ms ward display, ITC InSite mathematics coverage page is site theory in site rules ,matht recruitment info mathematics recruitment informer investigation Mathe quadratic make square rectangular plot investigation

quadratic information language display generate for ,no it robot intellectuel system mathematics invented equation ,x+y = 0 quadratic,
- no invented robot x,y function scater robot intellectual ,financial invented calcul, permit to account money ATM to save formule ,
- info language inventor informer
- info invented process,
Mark ROM,octal ,
- math info initiation information arithmetic logic process logic ,Espace pixel VGA,cla or, invention
-mathematici do software invention hard math PC ordinance sequence,MHz gigabit calcul logarith intellectuel processor it mathematics invented equation computing ,
-ms word disc mathematics character 100000 caractere programs frame program , excell table equation financial word limited
1099 word octa octal binary equation,-ms internet robot word page mathematics character system mathematics,
- do's mathematics code 00000,
- math inform science and computer science chimie info physical science chimie faculty chimie instrument, conversion synthesis,
-mathematici info et Polytechnic and science academic material mathematics,
- power supplies arithmetic machine ,process control project ,VB ,access , actual technologie ,info mathematics equation logic integral Lim actual review series automatic system robot language technology mathematics ward caractere , actually technology,information ROM ready, access.memkry,

,

to me

Schematic showing

to me

Schematic showing a 3 phone system new button visibility above ,each handset must installer ,intercom system used surplus ,
- parlist : handset regular telephone type no push to talk or sound ,power , lungs buzzer 6, volt Eduard 15 ,see text cradle switch phone or see text , strip text cases miss hardware,form system every 6 day or equivenlent ,6 volt interconnected , distribution such shake ,

- personal call plan :
Telephone call plan B1, B,2,B,3
Call A1. A1B1,A1B2. ,A1B3
Call A 2. A2B1 ,A2 B2,A2 B3
Call A3. A3B1,A3B2,A3B3
Call A4. A4B1, A4b2, A4b3
&1 alpha= the effect of in the level of fonctionnement call telephone call plan ,I=1,
Beta=the effect ,ab of factor level , x1 jk= , error association observations level plan analyse

- radiotechnic,
Power amplificator TV sound base oscillator pentad tube ,
Characteristics indirect cathode wire V,1 6.3 v,
Source wire,
Use conditions nominal RMS,
- voltage and. Va - 170---250V
-voltage grille. V get --170--250v
Voltage. 45 , 32m
Current. 62 2,4 ma
- coefficient amplificator. 15 ohm
- resistor internal 0,2 , 4,6 MV
Capacity
Capacity grille ...CG ---14,7 of
Capacity and grilled cage <0,8pd,
Value limited
Peek voltage anode vap max 7,kV
Voltage anode Va max 300v,
Voltage of grill. 3000,
Cathode current v max 30 w, 180 ma,8,5

+ Telemetry video output pentode ,power flip flop, ,

- emettor , af amplificator ,emettor ,compositor number ,receptor ,display , speaking,

- IR(t)=VRF cos (wi.t)=I(t)+Δv1
-QR(t)=VRF sin (wot)=Q(t)+Δv2,,
Insulation in receptor conversion,in case we Cree en our mixage voice I et Q ,, Voltage ,, quadrature, insulation mean level power

-typica using single side ,
telecommunication street distribution for new urban residential estate
Electricity peddel ,started conduit , road way ,
Legend ADSL signal spliten telephone , exchange, ADSL convey frequency , asdl modem yes customer premise,,
- typical grand copper twisa. Network telephone exchange, ,
Cabling homes for telecommunication completed guide home cabling ,
Line 1 yes ,line 2 yes ,,phone ,1 yes ,phone 2 socket jack yes , mode 3, 5 equipment,
Possible fault due comming of the telephone voice port inside , fault due to switch relay connect in mode ,,
-basic home network system typical cabling arrange and connection for , typical telephone and data services,
,Famut TV , bender PC, study PC, kitch PC ,wall ,,ethernal
Legend : modulator socket CCO,modulator coaxial socket , coaxial plug
Polyphase emettor receptor frequency intermediate heterodyne class,modulation phase phase (t)= cos (wt+$0)
Sin a (t)=o,then m (t)=o module phase shift signal module ,m(t) = sum ,,
-canal of transmission GSM cellular antena interval time area 577us signal terminal,
Wave electromagnetic tic plane impedance caractere area,E/H=377 ohm ,, schema btsbsc,msc network fixe ,,
Numeratation of voice
Fibre cider , module, filter decoder ,input output band 300hz - 3,4 kh, 13 bit cadence ,,
Input line l1,2,3, cabling
- circuit command selector , meter decimal Relais , rotational test , duplicate line off,cut line , Decimak control ,direct A, switch register in the register in the group the calling division aearxf variety,
Switch line ,switch final connecter ,signal control send impulsion ,interconnector , pilot switch start , div ,div,,,

-multivaria data analyse telemarketing,point ,dov sumb(x1k-xjk) exp 2,, structures equation

model customer loyalty adversity board award , quality imagine customer satisfaction,x x=, loyalty= b1 brand customer ,brand equity =C 1 advertising + c2 brand award + image price customer satisfaction = image price,
-diatribhtor performance
Distribution/ service ranking X1/) overall performance ranking y1// ranking differente d1=y1=y2/// diffential sequence,data analyse , investigation of association ,
- Winer trading plan bet
Net profit= number of wine bet x premise pay out motion number of lossi. ,bet premium, y profit or loss,w number of winning vet ,k payout motii,

-model : l

Model: ml 06NP, ML6,c
- capacity : 6kg -15-30
Resolution: 1g+2g-5
Weight range ,- 3 kg ,7,5-6
-train display ,zero net
- sub display: zero net ,vf d LCD graphic ,
Disparue dwe , ply memory/ ml on
Print / rypr , available size labej ,Manuel
Max : 90009,pl, width
- label printy , interface,power requirements ,power consumption, operating tem plotter size ,mm ,product model
- report financial
Option model product
1 m b memory ,
Specifications display ,operator ,5.2 LCD , 2x 16 pop up ,20 lines
Memory back up , data up vendum lithium ,power consumption , AC 120 v ,operating 9A, standards 0,2 A , operating AC 239 ,operating dimension

-system development:
Sample Gant chart showing progress system development activities by putting bar , Project planning documentau, page)
- system ware inventory system modifucatt system ware house ,
- system schedule activities completed activity,analyse

- activity ,/1/2/3/4/5/6/6/8/9/12/13/14
-required definju
-for project team
- definition and
- definition objectivity
-R3 interview whereataff/
Organisation required
Vo review
Design
- revise programm
- specific report
- specific screen
- specific documents
- soexifux Documents change
- management review
- implentation
- code programxhange
- build test file
- build test
- test produxtiin file
- revision product file
Revise
- production file
- revision
Test short Bev
Test product file
Manage teab
Install where house
Teaini new
- quality management iso 1999 totaj staicale process control ,produce software group project team
- product / vendor
Designer) Oracle
Development studies) Microsoft
Knowledge/ system architecture,system investigation use engineering computer case tools automate ,task required system high degree , package focused association stage v, arafw case tools selected
- development for orientation program
Frequency (y,x ..) 1/6/15/29
Head score x /0/1/2/3/3(5)

Score deviations/-3/&2/

Purpose: technical PC vs technology PC support ,
-Technical PC electrical electronics PC
Open lab ,mechanical electromechanic mecatronic system disc , buildings construction PC architecture PC
Art PC hierachie vertical horizontal process word , excell algorithm
 Fundamental PC ,
-fabric fundamental process system
Fabric circuit resistance ,
R: material, R=resistivity ×l/A , I =w,,R= resistivity .l/y.w=, R3= resistivity/y,,
-metalic late fabric , semiconductor film metal oxyd silicon Fuk autonom career ,
Sio2, ,,input R1/R2 ,,
DDP/Nikel, charged ,,,discht batteries radio
-Pbo2+2H2so4+Pb=PbSo4+2H20+b.bs0
Turned. 1/2πfc=2π.f.lresonanance,
L.fo..fox=x.l=796 khz select ,Copa ,,
-if filter modulation signal, mixer yes ,local oscillator yes ,,
-Am yes , 1mv, first r.f yes ampli, second ampli yea 50 MV,, detector yes , AF yes ,power out yes ,5V, 10 w,,
Dielectric: microwave , wireless communication technology yes ,master oscillator yes,
-master oscillator yes, multi yea ,power yes ,antene yes ,,
Parabolic yy advance ,
D= Pmax/PAV,, Scat = 174.698/DM,,
G= k(π.D.D/x),,impedt , Z =√R.R+xl+c),,z= R+j,,

-electronic digital analogic circuit ,,
Input a,b and gate yes z= A.B 1 kilo ohm,
Booleen algebraic,A+A=A,,
Identify booleen symbol switch circuit function F (x,y,z) = z in ,
Karnow map ,,y,z
AB+AB=A@b
- decimal number /x//y///z Min term ////max term

I/0//0///0////0////x,y,z/////x+y+z
_analofue computer , comparison analogues and digital computer,
Quantity,/analogue//digital,
1, representation /continuous voltage //binary number changing step
2aritmethic /by measure voltau and // by simple add ,losing course shift
Output of information/ graphical // languages quantity data storage,
Storage,
-potentiometer coefficient resulted and reducing voltage integration by factor (6/12), initial x= 6/12 chart capacitor, input output and gate,
Inverter integral circuit DX/dt 6/4
12,

Sum ,interger ,summat,
Differente RLC
L.di/dt.+R+ 1/c integral I St
E=L.dk/St.ln+1/c.inyegral, 0 time ,t
Timer ,o'clock

Initiation condition variable ,respect time St ,, IC input x,y output eo=[f(x-y)dt,, (eo)
solving differential equations,
12 DX/dt+6x= ,given x =6/10 at t=0, derivation, DX/dt+6x/12 ,equat,these 6/12 require at output integration,
-conversion
Digital input a,b,c,d yes D/A..output
Digital / analogue
D,c,B,A/
0000/0volt
0001/1volt
0010/2 volt
0100/3volt
0101/4 volt ,to
1111/15 volt
- full scale voltage , ex 9.1 5 bit D/A converter ,0,2 volt digital in 00001,analogue 11111, si SB =0,# v and 1111=31 full scale output = 31×0,2 V=0,2A , even 9,2 A 5 bit D/A Conte delivt in output current,100mA, digital input cours digital analogue output cours digital of 11@0@=10ma,, 20 = 10mm let B = 10/29=0,5 mA @110= 29×0,5=14,5ma,,

- algorigram equation booleay,,
Prog, start writing a few dug a possi yes , test run progrt yes,or fix bugs an introduction as news on possible, yes

Bughe , stopped,,
-x = 1 and y=1, yes A<Byes x-x+3 and y-x,y ,print z , A,< ,x,y yes , x-x+3,,y+x+y, z<x+y

-machine code programme ,x=4a.a+2b,z=N+(x-y)

-op -code /address
1001-load ACC/a= address 0000001
1010-multiple /b=address 00000100
1101- stop x= address ,0000011
0001-stop,,
- construction PC architecture design development,
Input unit yes mouse optical keyborad yes card red , control unity yrs memory RAM ROM yes , output yes arity yes CRT display print plate yes,
- database yes
CPU yes ,room yes,I/o, yes vertical ,
8 bit 69kbyt,, 64× 1 k=65536, FFFF,52428
Memory systt ,@00,
Digital / analogue,
Sequence+3v yes 0,15, yes a+b, A,B ,
Room ,ram ,,
Inlut
Row,yes and Dara,yes gate and output gate and ,
Transistor bipolaire logic diagram static RAM , ,select R , supplies logic ,y select ,,
- booleen algorithm: program, read write yes, memory registerer x,bit ,.Emory buffer,
-printer charge plate ,electrostatic , digital input ,carater source ,papper,
- lazsr printer ,trasfdr ,Lazer,mirror,module,
- ribon papper,character, rotau,
Magnetic tape. Supplementary capstir,data organisation file
-data memories time yes,
128 sector memoire, 564 bit sector,
Input output device microcomputer converter serial data , parallel decoding, microspace,ram 16×4 ,, binary input yes ,
- disc label plastic with write. Ed inde hols ,
-sectir track 2,255 byte ,logic process read, digital ,step motor ,
- NV ram yes ram yes ROM yes, CPU semie conductor yes ,hard disc driver yes , external yes flopy disc ,data 150 km to 12m ,@00 m ,
-Typical machine code
3 bit /5bit//descry
000A/AAA1/load AC
001B/BBB/

-adress / code//instructions
000/load branch output /load a.c
001/
0010
0011/
0011/,

Network interconnection cellphone PC ,,

Purpose: project and circuits ,series and features, and services
Constructional project:
Design concept, sample ,circuit ,
Part list multi message voice recorder,
-1 PC board code ,size 119mmx 57 mm
-electret microphone insert,
- 3 way terminal blocks PC mounting
2 way terminal block PC mounting,
- 2 pin section of Sul header strip ,
- jumper shunt ,
- 28- pin Dil IC socket , 15.24 mm spacing,1 8 pin Dil IC socket ,7.62 mm, spacing, 1 2,5 mm concentric DC power plug ,PC mounting (con) , audio phoni socket ,PC mounty(con 2)
- semiconductor
1HK828 voice recorder IC (ic@), lm 358 dual op amp ic2, @ 78l05+5v regilt(rsG @), 1 5 mm green led (led 1), 5 mm red led (led2), 1 1 N 4 004 @A diode (D @),,
- capacitor:1 ,2200uf 16v radial elect, 220 if radial electrique, @ 22 uf radial electrique, 1 4,7 if 25 tag tantalum, 1 220 nf 100v mkt metalisssd polyster , 100 nf multilayer monolithic ceramic, 1 ,150pf disc ceramic,,, resistor (0,25w 1%), 1 . 470kohm. ,2. 100k ohm , 9 , 22k ohm , 2 . 1k ohm , 1 , @00 ohm , @ . 47 ohm , 2 . 680 ohm,
From ,kit available
Link 1: in = beep disabled, ,,,lk2,/lk3/ operating mode , in /out/ 2 message, random access,/ out / in ,4 message , random accet, out ,out 8 message random,access ,tape

2. intelligent dimmer:

1 PC board , code 799, availabt ,service size 76 mmx 50 mm,
IP 65 sealed abs plastic case clead lid ,size 125mn×85mm×55mm (jaycar HB - 6#46)
1 .flush mount 3 pin main socket Jay car ps ,4094 , similar
1. IEC male chassix connector with mounting holes Jay pp, 4005 , 1.10 MHz crystal (X1),,,147 uH 5 A inductor jaycar LF - 1274,,,14 way Dunkle vertict sockets con Jay car H3114, 14 - wat Dunkle screws terminal plug (jayecar H M-3114,,110AIEC main cord,
-Semicondors, @ - 1 pic 18F 1320-i/so soic Pre programmer microcontroller,(I @),,
@.IR receiv jaycar zd - @952 (IRD@),,1BTA 16-500 isolated tab triac (triac @) - do not substitute,,@ Vc337 NPN transt(A1),, 2RGB 5 mm common anode led (led and led 2, 11 N 4004 diode (D@), 1 UF4004 ultrafast diode (D2),,11 N47341w,,5,6v zener diodt(zD1),,
Capacitor: ,,1470uf. ,16 v radial electrolytic,,1100 if @16v ,250v, AC x@ metallised polypropylene,,@,1100(0,1uf)250v ,mettalliaws polypropylene,,14,7 nf mkt polyster ,222 ceramic,,
- resistor (0,25w,1% unlet Alexi
13,3Mohm ,1w. ,,110kohm ,1 w,,11kohm,11 John wirewound , 12v operation,,,14709ohm 5 w wirewound,,
-miscsllabsouse,3 m3 x 25 mm nylon s Rew (to secure px board, 2 m3 x 15 mm nylon s Rew for IEC connector, 3 m3 ,12 mm nylon space,10 M3 nuts ,,, 1.100 mm of 0,6 mm dia .tines copper wire for link ,1200 mm length 3 ,core Naina flex 250 v 10 A rating , 14.8 mm red spade connector fully insylau, 14,8 mm yellow spade connector fully insulated , 14,8 mm yellow spade connector fully insulated , 5 100 mm cable ties ,,
- additional part required for testing:
1 .12 v AC ,50 ma ,or 1 A plug jaxj , 112,
1.12 v ,, 300mA light bulb
Design : drilling the lid ,,install with crio ed, components side board ,,copper side of board ,, cut out for IEC mains input plug

- building the circuit wizard way ,
Decade counter ,0-9 using j- bistable,amend ripple circuit and gate, flip flop ,
Investigate
- a block schema diagt of logic system ,,under carriage door warning logic
Five door switch logic signaj respective door open and logic 9 when close all warning indicator are active low visibility audible, study what logic level appear point x,y,z all door closed, wath logic level appear point x,y and z with the left wing door open and all other door closed ,wath logic appears x,y and z with open all door closed ,4 when any more ,
- answes to xhet quest ,,feed back via collector
Mp lab,library install tutort program
-led
EC reflow new professt,PCB operated from professional machine

-supply voltagt : 239 v / 50hz only
Power : 3500 w
Weight: approx 29kg
Dimension 629 x245×520 m(wxHxD)
Hear methoy , combination it grad and
Operat: directly menu button LCD ,
Menu ,englit,, temperature #5to 300
Maximum pcb size ,400×#85mm
Temperature ,2 internal ,optimal
- tear measuy
Component list.
Resistor: r1,, capacitor, semiconductor D @ to ,IC ,,miscdlanouss

String buton and function using button s 1, S3
- command action interacty command
Lab testing

Specifications:
Suitabifor 2×16,4 and LCD display using stanu14, or 16 pin connector back software controller,backlii,
5×6 matrix kepad for maximum of 12 key switch or nine rotary encoder building inpusht equivalent,buzzer,on led,power via USB,external 5 v supply primary cell,0,8-4,4 v lipo battery ,5 v and 3,3 v regulatority sodtward on off contri possible, lipto battery charger measure , 34 bit ,48 pin LPC 1343 microcontroller with 32 kV flas memot ,8 kB ram and numerous peripheral like USB, ix,spu,mlu uart , compatible with the free LPC presso ,3,4 and
coocoz ,ise,,compatible,debugger, extension connector almot, availability on connection ,splita le , detachable Min 4 key pad maximum. 3 rotary encoder ,dimenst adapted to type 2616099 case open source ,
Operationel: microct,stars is oscillator
Arm operator logic

Purpose: open lab system, game completed module test test practical, test power electronic numeric ,logic sequence, programmation amplicat feedbat,
- experimental voltasi out + 15 VCC protection short circuit ,12 vci ,2 ,24 VC,
functionalite,generati onde sequence amplificator 5 v , frequency 1 Hz to @ generator ,@ Hz , transitor Montee,@ Hz to 1 khz , transisty logic true false
MOSFETs, cont rectifier motor inverter, principal ,12v ,3900 rpm ,1,2 A , 3 cm ,
logic numerical ,4 and (2 input) and ,3 input ,12 and , 4 input , 12 diodes , restrictions, study ram and stockagw information ,pannel ,4+4 buffer ,3 stare register buffer ,8 bits ,decoder , of 4 ,19 ram , 1024×4 displt, hexadecimal, analogic 8 bit ,convertisaeue ,8 bit poteu,
Bistable panaux , demultiplex,4 flip ,compare,4 cannot, register , calcule , arithmetic,16 logic ,4 bit , compte binaii,decodeur elrom ,8 sons led decodeur , linear discretion ampli relay , cablage schema , test execut ,system mesure norm , network transmission,53 MBS ,16,,
Biomedit, multimeter,3 and 3/4 ,voltagt cc ,490 MV , 400 v autirange generat, ,,
- detert type size ,if move water ..
If , else , else if to ,increase,,
Procedure PC ,input file control ,select print ,data , print file ,work store , registration ,

Purpose:
PC speciation: format
Intel core 7 , exaterne 975 @ ,3,3GHZ,,Intel DX58SO motherboard,6GB ,G skill trident DDR-200 channel,gainward ,GTX580 sponsored by evetexh ,wD 320GB ,data IU Hard drive ,Intel core ,I 7 870, Gigabyte P55-UD6, LG flatro n , Kingston SSD now ,,
AMD ,, specifications:
A, essential up grade, components, AMD , procedure , chip choice: the starting dusk x 2550BEb,CPU ,,X4 645 upward faster closely, processor ,direct conflicts show improvement,load processor specific benchmarks 3d rendered video encoder x 264 raw computation performance of up graded CPU increase ,time faster CPU therm ,,fps function ,,
-graphic upgrade: news little graphic card up date gaming Phenom power x 25550 choice graphic card filled card up grades , sub R1,500 budgr choice HD 5770 bigger to jumping performance DX 10 gaming word in conflic,
-playform up grade , CPU up grade path for LGA ,775 sockey motherboard PC area ,LGA 775 core ,3 GHZ, core, 2500 k CPU , 4GB of DDR, ram ,,
- direct x9 tessellation performance,
Heaven 2.5 / frame per sencodr higher better

Base system with sapphire HD 550/@7,#
-ugradr to HD 6959,
Direct x 9 gaminy performance
Lost planet 2/
-word conflic /
-far cry #/,
-0n the card tried edge graphic tracked down @gb sapphire 5850 Xtreme , retailing R 2000,price complain 6 pin power connector which PSU PSU had it physics driver installed benchmark away, result were disappointed 3 D marks improvement less word conflicts did manage,lost planet frame wallet being R,2000 light, completed reliable,
Battei g ram: slot 1,GB system memory stick R150 ,ram benchmark,ram ,,
- upgrading memory and processor GB ,test windows CPU,the HD
Windows shopping GB driver
-rigth components for the perfect budget building: perfect machine
Shopping list
- motherboard
F1A75-M - R1.100
-Processor and
A8-3850 - R1,300
-Ram: corsair 4 GB
1,600mhz -R1,000
-graphic:xFX random
HD 6670. - R 1,000
-storagr ' seagi
750 GB - R 610
- opticy ; lite on DVD
Rw- R200
PSU; Corsair 430w R470
- chassis : cm elite 343/
-total: R 5,360
Purpose
Built: test components:install CPU vital component case layer CPU guard ,CPU pea, lockdown add sized ,
-cooler and fan : fixing , bracket underneath ,screw holes fitting ,connect cable mobos ,
- fit the ram : ram open the catch,snai lock motherboard, memory Chanel ,1 and 3 operate,
- the graphics card ,CPU bandwidth drops xb soon involve another GPU, in an slu ,cross fire x array ,. manufacture usually,x16
-hook up the PSU connect ,20+4 pin connector to mobo,the 8 pin EPs cable and whichever 6/8 pic ,
-test the components: power that sucker up by turning the PSU hitting button ,your screwdriver

board
Striking the balance, because corsair 4 GB 1,6000mhz DDR3,liani ram APU shares the systt ram between CPU and CPU match up ram gaming rates between at 1,33mhz and 1,600mhz case , resolution monitoring

Prep the case : bits ,ATX backplate and mounting screws, install the PSU screw top bottom cable out way module,drop in mother remove the GPU from mobo for the CPU Coller ram still in place mouti f screw it in place round,
Reunite GPU and mobi surprised fiff
Ddly your case will allow pop out some driver bay possible card back top pcu ,
-test it still works : connect the PSU cablt mobs CPU power ,case fan yet post beeps or led light up your,
-tech analysis:
2560×1600 screen gamii surplus frame ,R 14,00 flashiy GPU bios ,
CPU rendering performance:
Cindbdnxh r11,5;/index higher is better
-gaming/533
Direct x 11gaming performance
Dit3/frames per second higyis better
Stock biof/355
6970/408
-direct x 12 gaming performance
Shogun/ frames per second high better
Stock / 442
- hard ward reviews
-laptop repaired : screen replacement ,motherboard repair,ram,harddriver,CPU up grade replacement, batteries charge, domain registration, capped ,ucapped,internet ,fax ail voio,Intel B800,3gb ram /320g HDD,wireless ,/15,6" screen webcyfull keypad, camera chanej DVR
-ugradr ,repaired build PC,upgrade key component ,fixe PC proby fast ,set up a home network hardware
Byii componey process hard ward,tools,checking compatible CPU socket ,ram core components,installing motherboard access Ga - 88gm - ud2h,USB support ,installing processor ,installing a coin,install ram modukr power,installer graphic card ,PC's reason HD 6870,power am 1gb of ram
Installing internal hard drivfer 50gb optical driver part built up grading ,px lb 950S BLUE RAYY ,BLING MEDIA BUYB,CHOSE READING SPEED CD
- UNPACKING A POWE SUPPLY UNIT , SHOPIFY UNIY MODULE ,
Case and feature fan cooling
Up grade a PC choosing components open computer replace component challenge damage electricity,remove before process ,scenario compatible, completed desktop system,custising PC

build configured a desktop PC ,budgr PC cash
- perpheraks gadgets,installing TV tuner ,HD hard ward connecu, hardware projey, windows,
-aoc LCD moniy,case OEM,case raidmax gaming,cattex networks cable and accesorie,cps pose back up solutions,g data antivirus, Kingston memory solutions,maxcam secury
solution ,Microsoft, tower server cabinet end closure

Purpose

Purpose: word display manufacture
-Introduction technology, teasing compagny specialist in it components,
Required market effective technology solutions custome the product security surveillance soluy, networks,point sale server encloy it components,
-Mission: provide technology added value business,provide quality product , creation make different,
-valur : accountability commitment quality ,honest integrity,
-vision : to inspire purpose great place work member learn productive business ,
-partenera chanrk ,
Social but transformation bee compliant ..
Product Guide :
LCD monitor,screen size : 21,5"w/23,6,viewable image size : 546,86mm,display area : 476.(H),268,1@(v)mm, brigthness (typical):300cd/mm,contrast ratio (typical) 600000:1(DcR),response time (typical) 5ms, viewing angles: 170/160(car 10),max resolution:1920×1080@60hz,
HDCP compatible: yes, input signy: analogy RGB and dvu, user control menu, enter image ration source ,up auto / down power, power consumption power ,on < 49 stsndat<0,4w,wall mounted: vrsa 100mm, mechanical function tilt ,5-29,
Specii features : touch key USB ,by DcR glossy
-type qori - 335 case:type ATX Min case,motherboard: micro ATX , external ATX up (up to 13"x9,6),(p4ready)
-power supply : 400W Culp,P/s with 12cm fan (20+4 pin socket 775 ready)

,5,25" drive bays:3,3,5" drive hidden:8, expansion slots:7,I/o interface USB x 2,mic x 1,spk × 2 ,cooling fans front ,80mmx1, rear 80mmx1, dimension (DxwxH):410x182×425mm,M/t(cuft):1,73,
-frint mount USB ,audio, high,green LCD fan, external bat : 4,5,25"and 3×3,5",internal driver bays ,4× 3,5" HD,,system board ATX form facty ,13",×10,5 , expansion slots standard ATX 7,material SECC steel, dimensionnement: 52,25 x 20,5 x 45 cm (lxwxH)
- raidmax modular cabling system durable titanium mirror grade block wraps , mesh cable to mention 20 total power connector for all your computer, type : ATX12v,EPs 12v, maximum power: 730w,fans 135 m blue led fan ,PFC no ,main connector ,20+ 4 pin ,12 rails ,PCI e connector ,1×6 pin ,1×6+12 pin ,modular cabling support yes , energie efficient : up to 80 % ,over voltage protecyyes,
- network cable
Cat 5 e cabling: 500M solid,Uto,24AWG,0,5mm,4 pair,grey,,305 m flex or solide ,Uto,24 AWG,05 mm,4 pair grey
,,cat 6 cable .305 flex or solid Uto,24 AWG,o,57 mm,4 pair ,Gray ,to ,,
Cable tester digital tester ; cat 5e, ,
- toolkit: j-059 long nose pliers (159mm),hy-103B micro cutting pliers + 159mm),by -330 cable blade trividr,hyp -5022 wire stripper ,hy 568 telephone plier ,8p8x/rj-45,hy-324 punch down tool ,tape line ,2m knife, by 329 wire stripper economic hy 539 soldering iron 30w,cable tester ,tweezers 125 mm, crystal screwdriver, -+,module plug rj-45/7p8c x 6 PC, plastic box ,315x255×55mm, crimping tool,Rachel type dual crimping,punch down tools, wall boxes cat signle part RJ 45keystine jack ,surface mountable ,car 5 double ,RJ45 jack surface, carb
- connector ,boot sleeves ,RJ 45 cat micron connector ,standard , cables make female 15 pin VGA extenst available in ,2,0 m ,3.0 m,5./ ,Male to male 15 pin,
- 1000va /2000va rack mount ups ,
-patch panel 24 port Uto cat 5 e panek w / t back bar , 48 port Uto cat 5 e panel w/ back ,,
Battery voltage : 24 VDC, recharge tine ,8hours to 90% charger ,input voltage 110vac , .Or 220va c 25;,output wave from , pseudo wave , protection : output short city overload protection with current limiting,protection output circuit overload , 659 Va line interactive ups ,auto restart while AC recovy , provide overload protection ,compact size ligthb, automatically voltage regulator Ave , battery low voltage automatic , microprocessor control ,provide modem phone line surge protectors option , equipmt input voltage, building DC start functionalite enable ups , input commercial power range @45vac - 280vac ,AVR range 165 vac , frequency ,59 z +- 10%<, output commerce power : sine shared frequency AVR voltage range ,220vac auto sensing , transfer b,gross weight ,6,1kg ,size (mm) DxwxH,,260x96x135,,
-Data manufacture data security, security technology,new top security PC performance, high security,under completed undertectabke ,self fingers printy,maximum security record test winner ,, antivirus program enginee,anti spyware ,antipgising,antirookit,child protection ,system tuning , firewall,internet security,
Award technologie include double scan ,outbreak shield ,integrajitblocker ,special utility ,scan all

compression file and archive formal, heuristic detection of virus, g data antivirus manage ,client ,premui support,,
- client security business ,g data antivirus management server,client ,internal desktop hard driver availt 1000gb
- value ram desktop memory, note book, server memory,,data traveler flash disj
Free agent notebook external hard drives store Dara ,synch data between PC ,back up fil,, digital broadcasting,
Serie projector , 3 projection system ,3 LCD panel ,1 lens projection system, resolution,RGB,1024,668,lam 190 ultra high pressure lamp,colorboutput 2000 lumen ,video input composite video , audio input ,
PCI , expression Serie , astaud performance,graphic processing ,stream processors 240, core clock 633mhz ,memory clock 2268 MHz ,memory type ,896 MB gdr3 ,memory interface 448-bit ,shader clock : 1404 MHz , bus type : pxu Express ,3 ways slu technologie,direct x support ,CUDA technologie 2 ,SLI technologie,Nvidia lumex ,dual link ,2 Nd generating architecture HDCP capable
Discovery vision

Purpose : Program analyse data,
- adabase ,storage data , association and work file access logic ,database modification and transaction ,introduction natural , accessing database , basic rwiten ,edit mask ,arrays , arithmetic more advance report condition statement , additional statemt data manupulr natural system command ,system variable ,session ,system functionalite ,input statement functionalite data area program editore Mao,, gierachir , network model, nucleus buffet poopl.i/0! Disk actual data ,parallel process , interface programme implentation methode control ,format buffer ,record ,search buffer ,value ,
- SQL data manipulation language , civil and pl statement written embedded , exce read logical ,natural acess operating system
- civil ,
,General control block ,file control block field descrip data storage space ,up date command record is added to file new ,up date field value in fult ,manage command ,
- database modification : add if new record selected exist , competition uptade case , user ,1 cancel days yes ,read employee file leave = 5 ,up date leave = 0!,,reserve days ,read reserve day 15;,read file 5 up file leave ,29, transacy concept ,the limited ,rejected accoun
Find statement,basic format t ,define data , employee ,personek I'd address ,end define ,number city address ,view

- break statement csalary record , department code namt
- compagny,
Definition module:
Employee
T l db name f Leng s d remark
Personal I'd ,first nane ,dare birth ,full address city ,zip ,post code ,telephone ,job ,
department , position current leave take ,leave booked ,leave start ,salary ,currency position

- data area editor: define variable with t data editor , define data ,emp ,name , surname,first name ,Dept ,
Incode ,
Date natural for Unix library name ,time software AG libraries , Unix fin ,,
Empl ,A,8;
Name,surname ,job title ,edit

Purpose:
Civil and development a program,
Program pli,code ,
- input output firm due suply ,name ,file ,record ,size implied decimal ,point indicate , name of output file record layout working ,storage nNe form ,outpy record number,
- hierachy diagram and pseudocode ,program logic planned hierachy diagram pseudocode indicate module , informs to plan step ,program ,stsdard , was ,I ,o ,start 200 first ,20@8,
- modular programming , program readability debugging,
Program readability: , picture value coded , working field , accut total ,
Program specification : position , 1-4 , field employee number ,name ,office number , telephone,,type numeri aplhabdt ,
- enter progi: also under sudej , save program , type word , compilation
- execute the program : the name input program computer :
: Report on disk in order to print later stage :

- debuggi on the program ;: if report is not correct ,logic error in program that correct , person number ,name office number repeat ,states was omitted from , in case error access ,
- instruct print report input for program data ..
Output program :
Record layout , take record , input ,file name yes ,input record ,implotr number ,20-30 0 employe name , 50- 60 office number , 60 telepy number,
- acubol : identy progr I'd program , Uthor ,date waruten ,date complied,
: This prohray print report with information aboyall information:
Enviy diviy: configuy PC IBM , object IBM,input ,output ,file control ,select employee file assign to disk ,orgNizTion is line sequential
Ms soft COBOL : calxuly ,computer es wage rounder = 1 hours,tariff, computer newrou
d ,prepare line , move @- to no ,
- Engineering comlGni increase
Number / hour/tariff ///current /////wage permitted//////new/// wage exceed /

Hierachy program
Work storage
Posityreddfune was position table , occur time
- procedure divisy , open input file report file ,error file, perform,read table time ,

This is to confirm that an incident was logged On: 2025/04/15 7:56:06 AM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za 7:56 AM (2 hours ago)

to me

Dear Tshingombe Fiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**2164593**
Summary:	Re: This is to confirm that an incident was logged On: 2024/06/23 2:12:06 PM (UTC 02:00) - Africa/Johannesburg
Customer Name:	Tshingombe Fiston
Location:	
Priority:	3
Status:	Logged
Category:	

Description

Important: This email originated from an external sender. Please do not click on email links or open attachments you did not expect. When in doubt, please contact the ICT Service Desk.

On Sun, Jun 23, 2024, 14:12 > wrote:
Dear Tshingombe Fiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #

1900050

Summary:

re: letter explanation theoretical pratical base work , n diplomat award engineering electrical

Customer Name:

Tshingombe Fiston

Location:

Priority:

3

Status:

Logged

Category:

Description

Important: This email originated from an external sender. Please do not click on email links or open attachments you did not expect. When in doubt, please contact the ICT Service Desk.

Re:/ award diplomat certificate,markshet transcript letter experience theoretical practical engineering n studies outcome
Inbox

tshingombe fiston >
May 29, 2024, 6:26 PM

-Address:postal.
-Francis bard Pretoria Department of Higher Education and Training
123 Francis Baard Street, Pretoria Central
Room 506_012 312 5440

To:St peace college and instituts, tvet Dhet
-Date :subject :completion letter :
Practice experimental log book.
_____

-1. To concerne
This letter serves confirm .Mr was participations in the work integrated learning programme of department : Dhet research assessment irregularity national examination nated n4 to additional information and workbased on visited circular practice external on line job work practice on department of energy minimal compagny career CVS and industrial portal council work city power day visited on line Facebook,Gmail badges,Eskom career day 28day appointment,sarb career engineering artisan electrical electronics engineering,Microsoft Scheiner career certificate training, Eaton electrical dtic day project engineering ,sasseta saps psira career mil engineering career metropolitan ,log back project isita DBE and participate assessment engineering electrical for n studies engineering n diploma national framework work qualifications NQF saqa subject research engineering electrical at St peace college 20days work ,circulum on line computer practice topics research engineering electrical at St peace college practice CVS computer aid .from 20 february 2022to 20 april 2024 in the area of engineering it expected following subjects.
-Computer and information management system in education learn engineering assessment police and safety 1,and engineering safety security.class orientation guidelines./technical documentation libraries engineering learn.
Outcome career subject entry irregularite time table revisit , irregularite career material illegal job material induction mentorship subject trading entry subject trade electrical

theory , industrial electronics , mathematics, engineering,electrotechnic , industrial orientation science engineering drawing n1,n4,n3,n2,n5,n6,nstudie career experience exhibition electrician wiring panel,code ,generator power station transmission engineering subject irregularite career policing subject detective , business studies career ,advance field research electrical career lecture asssessor senior trade theories lecture irregularite engineering trade , module week material AC DC courent mesure instrument , exhibition career power station plant theory sum AC +DC machine +instrument measure to evaluate generator , transmission career job and advanced continued assessment framework qualifications compagny,summarise module subject math , engineering science draw .

-1.1Section one

_____

1.2 Assist in the capture /profiling of job application career portal log activities on line internet project data development engineer path azure GitHub Microsoft autocad Autodesk Microsoft
-engineering design analyse.kheta advice national career ,investigation system visual studio development.ms office . engineering electrical automate programmation computing trade theory assessment subject time table allocation topics.enginering drawing n autocad topics relate nated Eaton assessment
2.typing of memos and minutes exam papers topics assessment self assessment draw sharp table engineering electrical planing.
1.2.design of reporting template: tableexcell ups engineering electrical software.
-management and training assessment panel wiring electrical
-assiste with headling career filing .
-capturing of career information system.database recruitment informers investigation electrical data source reports.career portal advices .
-sorting distribution files information management system Education irregularite database system Portofilio.
-allocated consultation and information record management system database assessment.engineering
-handing inquired admnise communication skill , orientation industrial design template attandance registration on line form visual basic ,excell ms word .
-relation labour handing of Portofilio survey interpretation status ..
-duty monitoring assessment moderator asssessor engineering electrical n studies and level irregularite material suspension transcript marksheet years .
Staff, daily staff delegation compilation of duty .
-monitor
-filing of retrieval of engineering assessment transcript record instituts saqa college topics project azure back log ..hrs practitioner..

_____

1.3.library and information service :sciebono career center and St peace college info class re rwiten

"Engineering science career" ,
-research process : reseach method plan and disc ,collected and collected capture analyse collaborate and create management store preserve share and publish assessment textbook topic, monitoring and evaluation,emerging qualitative and quantitative missing text book engineering electrical.
-research methodology engineering electrical topics vs research triangle.qualitarive methods quantitative methods ethnographic participate observations studies depth description engineering communication source data engineering ethnographic r group, participate research involving esearch case studies engineering electrical,source.
-textual critical in social engineering,survey aim to provide overview,
-experimental design laboratory controlled conditions physic psychometric technical ,field natural experimental design ,aim to provide a board of a representative sample of large .
-secondary data analysis using existing data it aim.
-conceptual analyse meaning of ward or concept clarification theory buildings on role building studies,literature review studies .
-types of qualitative research design ground theory research narrative.hiatorical case studies and phenomenology design engineering field.
-grounded theory is systematic procedure of data analysis typically associated.phenological studies design engineering electrical,case study research advanced field,
-wath are research method in library data collection first is to choose a suitable methode for collecting primarily data depending reseach topics objectives methode interview observations and case subject..
-step of library research process identify and development topics do preliminary locate material evaluation make note ,rwiten papper ,import method for data collection ,survey quantitative interview library.
.1.4.1.technical documentation in simple steps: business files and data during operation documents size store career control access keeps record and analysis career outline engineering step on line save download day part time learning.
-consider a degree or certificate.
-develoo skill on experience.
-primairy :collecting record work clerk retrieved engineering career .
-cataligi g data files and digitalise create file documentation organisation job engineering research analysis thing .technical knowledge soft ward .help desk technician types customer service , responding to customer support inquiries and documents feedback from customers .Google it support rating .
-research faculty teach and learning research lab learning environment clinical simulation practice of simulation teach to develop outcome student team work communication self assessment, simulation base education la assessment,task training task oriented , simulation lab ,booking Education technologie, engineering science career electrical module engineering board

-work purpose lab work conduct of experience,prepare work ,note book, of log book

prepare rwiten engineering general format engineering, introduction theory procedure methode ,result vocational career trading guidelines.

_____

2. Section two.

Department energy mineralogie compagni ,Eskom
-related minimum experience.
Technical experience and engineering related technologies, skill and competencies leader .
-knowledge: relate technologie design codes and standards , engineering theory relevant processes ,police guidelines and legislation engineering design.
-technical problem solving co technical cost analysis presentation.
Key responsibilities , resolve complex integrated engineering problem variations integrate life cycle plan for .
Provide special engineering,advice assistant manager engineering projects modification.perform technical and financial evaluation

-Power Serie books on line research team future of power engineering lie experience engineering. Topics
Application post :28days booking confirmation shared successful or unsuccessful.plant generation substation power station transmission metering post megawatts financial .

-planing design construction of overhead power line principle system planning .insulation . _fundamental and practice of overhead line maintence . theory of overhead line management topics , implementation of work sole inspection
-practical guide to outdoor council engineering high voltage characteristics electrical test specific flowchart inspector.
-theory design maintence and life management of power transformer,theory principle and practices of design , fabrication overhead power line structure of towers moves and diagrams.
-power line tower one testing .
-transmission theory design and performance role ,in electrical design ,AC DC, ,hybrid,loss may , economic DC line conductor , conductor charge .
-thermodynamic for students practicing engineering under thermo essential for power plant design and volume , outline key thermodynamics,
Princit steam and plant compressor refrigeration plant entropy engineering to design thermal fluid machine theory to plant operating and new design is
-applied system dynamics with south Africa case studies system methodology for studies manàge change over relief respect flow accumulation material control the flow industrial.

-practionner and sustainable mentorship and coaching book

- 2.2 .purpose career explanation : course customers training manufacture execution scheineder electric PLC introduction to PLC level 1, ecostruxure control exper programming level 2,intermediate introduction machine ,ecostruxure process expert hybrid process, supervisor control 2data acquisition software configuration workspace situation , network connectivity control ethernet io ,human machine HMI programmation, telemetry truo licensed radio remote connect ,
-motore control introduction to variable drives altivart process system ,low voltage electrical distribution l.v.e.d ,SPD ,surge protection device ,on demand.
-low voltage low voltage distribution l.v.e SPD ,medium voltage permet set , medium voltage electrical distribution m.v.e, electrical novice ,
Ecostruxure power monitor expert power monitor project deployment
-explanation diagram: note technical
(Ups stream) , yes (USC %) ,=yes HV (transformer rating)=yes ,(power factor coincidence duty factor fore seable expense),(yes load rating).
(Conductor charabke ,busbars,length, width, thickness,cables, type insulation, single core, length,cross section, environment,ambient temperature, installation method,number of,) Yes,,(ISc at transformer terminal)yes ,,ISC LV switchboard out goes)yes : (ISC switch board outage ,yes head of final switchboard yes),ISC end final), (breaking capacity,) yes(SST and install trip sitting yes) ,(breaking capacity yes , St and strip ,(breaking capacity St ms, final .
-explanation: calculation impedance of power source the up streav network the power supply transformers as well as of the electrical lines
Problem consider a 20kv network that supplies a HV / LV substation via 2 m overhead line and MVA generator that supplies in parallel the busbare of the same substation two 1000kva parallel connected transformers euply the LV,busbar which in turn supply 29out gears to 20 motor including the one supplying motor .all motor are rate 50kw all connections cable are identical and all motor are running when the fault occurs the isc3a d up value must be calculated at the variouse fault location indicated in the network diagram.
-point A on the HV busbars with a negligible impedance.
-point B on the LV busbar,at a distance of meter from the transformer.
-Point c on the busbar of an LV su distribution board .
-point D at the terminal of motor Mthen the reverse current of the motor must be calculated at C and B .
up then D ,A

_____

Upstream network

U1=20Kv, SCC=500MVA , overhead line,3 cable ,50mm , copper length=20km,
2). Generator, 1MVA ,xsub =15%,t
3) transformer , 1000KVA secondary winding 237/410 ,USC=5%
-mIn LV switchboard 3 bars ,400mm sqr /ph copper , length=10m,
-cable @,3 single core cable 400mm aluminium spaced laid flat length =80m,
-Lv sub -distri utilisation board neglected the length of the busbar,
-cable ,3 single core cable 35 mm sqr copper 3,phase length=30m ,
-motore

Drawing 1.

Reactance x and resistance are calculated with respective voltage in the installation relative impedance
-solution :

Section. |Calculation. |. Result x,R

20KV
1.upstream network|Zup=(29×10 exp3)exp2×10 exp 6.(1)
Xup=9,97 zup (2)
. | X(ohm) (R(ohm)
Rup=0,2zup env 0,2 xup
X=0,78 ohm
R=0,15 ohm

2.over head line |XCo=0,4×2 (7)
|RCo=0.018×2000÷50
X=o.8.
R=0,15ohm

3.generator | XG=15÷100×(20×10exp)÷100.

-RG=0,1XG

20KV fault A. X(m.ohm) R(m ohm)

4.transformer | Zt=1/2×5/100×410 exp2/19 exp
Zt on LV side | XT ~ZT.
Rt~ 9,2

410v

5.circuit break | . Xcb =0,15 ,15 ,,0,15

6.busbars one busbars | xB=0,15×10 exp -3 ×10
X=4,2, and R°0,84

RB=0,023×10÷400..
One 400mm .sqr bar
X=1,5 m ohm
R=0,5

Fault B
7.circuit breaker | xcb=0,15
R=0,15

8.cable.1
One 409 mm cable
Per phase |xc1=0,15×10 exp -3×80 |
Rc2 = 9,923×30÷35....,,

Fault c
9.circuit break ,xcb=0,15.....

Fault D
11motor 50kw |xm=25÷10×410 exp2/5010.9×0,8)×10 exp ,3
RM=0,2 xm

Impedance calculation : fault at A(HV busbars is to the generation
XA=0,78+0,8~1,58 ohm
RA=0,15+0,72~,0,80,
ZA=√RA.RA+XA XA~1,89 ohm
IA =20×10 exp 3 ÷√3×1,80~6,415
Peak asymmetrical ipA, RA÷XA=0,55,,K=1,2
IPA=1,2×√2×6,415=10,887A.

Fault at B LV base (1,2,3)+(4,5,6)×R,,97 motor .
(410÷20,000) Exp 2=9,42.10.exp -3
XB=[(XA.0.42)+4,2+0,15+15]×10exp -3
XB=6,51 m.ohm and RB=[(RA.0,42)+(0.84+0,57]× 10.exp -3
RB=1,77 m.ohm
- fault D motor (1,2,3)+(4,5,6)+(7,8)+
XD=(XC+015+2,7)×10 exp -3=21,52m
RD=(RC+19,2)×10 exp -3=28.2 m.ohm

RD=(RC+19.2)×10 exp -3 =
ZD=√+RD.Rd)+(Xd.xd) =35,5m ohm
I'd=410÷√3×35,5× 10 .exp -3 ~ 6,700A
RD÷XD=1,31 ,, K~ 1,04
104×√2×6,700~9,9000A
XM=(605+2,7)×10.exp-3~ 140 ohm ,ZM = 624 m .
IM=410÷√3×624 ×10 exp -3 ~,379A
20 motor ,IMC =7,589 A

-ZB=√(RB.RB)+(XB.X.B=6.75m ohm
IB=410/√3×6.75×10 .exp-3=35,070A.
RB/XB=0,27
XC=(XB+0,15+12)×10 exp -3=34,7mohm
RMD=(140/19+19,3)×10 exp -3~26,m
ZMD=43.8m.ohm
IMD=√410/√3×438×10.exp 3=5400A.
6,700+5,400=12,100A en and iPad ~ ,18,450A.

Symmetrical, method 3phase network is unbalanced, magnetic cyclical impedance no longer , voltage
-positive sequence , negative sequence.
I3,I2,I1 ,we vector geometric construction. Labell

-Fault estimated,
7,440×410/20×10 exp 3=152,5A
Rough calculation.D
Sum x = 4,2+1,5+12=17,7 mohm ,=xD
Sum .R=7,2+19,3=26,5m ohm .
Z'D=√(R'D.RD)+(x'd.xd)
The peak iPad
√2×7,430~10,500A.

Peak asymmetrical 4.8 time their rated current of 98A: 10,500+(4.8×98×√2×20)=23,800A.
-G=e. exp j.2π/3=1/2+j.√3/2.betwen ,I1,I2,I4,..
I2=a.a.I1+aI1+I1
I1=I1+a.I1(2)+I1(0)

I2=a.a.I1.(1)+a.I1(2)+(I1)
.. calculation IEC , 60909>550kv.,
UN./√3fault

Type.of short circuit|

General situation
||fault occure
-3phase .I|||ik3=x.un/√3.|z1)
Zk°√Rk.k+xk.xk. |. I''k3=C.un/√3|z1.
-Ze.=©©|Ik"=c.un/|Z1+Z2|| Ik"=c.un√3. 2|Z1|

Phase to earth Zsc phase o |Ikez=CUn√3|Z1|÷z1.z2+z2.zo+z1.z2.
- Ik2el2=Cub|Zo-aZ(1)÷Z1.Z2+Z2.Ze+Z1.Zo.
Ik2EL2=C in |zo÷z1|-a ÷Z(1)+2Zo
-_____
UnQ=20kv
IkQ=10kA.
T(St.
Cable In.,4m, in =400v,
Sr=400KVA
Ur THv=20kv.
Urkv=4%
Pkrt=4,6kw,
R(o)T/Et=
Problem network supplies transformation, Ik" peak short circuit,I=4m , 3×185mm,sqr Al
ZL=(0,208+Jo,o68) ohm .km
R(o)L=4.23, X(o)L=1,2.

Solutions fault at F1, impedance of supply network (LV.)
ZQt=CQ.UnQ÷√3.I".kQ×(ur.TLC÷urtHv)exp 2=1.1×20÷√3×10×(0,41÷20)exp 2= 0,534.

Problem power station unity
Stag=250 MVA,,,UrG=21kv ,RG=0,0025 ohm
X"d=17%, XD sat =200%, cos alpha , ,art ,= 250MVA,,
UrTHV÷Ukr=240Kv÷21kv,= ukr =15%,

Impedance generator ,
X"d=x"d÷100×U.U.r.G÷srG=17÷100×21×21÷250=0,2999ohm
ZG=RG+jx'd=0,0025+j0,2999
|ZG|=0,2999 ohm

Srg> 100MVA, RGf =0,005x"d,ZGf=0,0015+j0,2999
KS=UnQ.UnQ÷UrG.UrG ×Ur.Ur×tLv÷ur×thv×Cmax÷2+|x"d-xt|sin alpha
ZS=ks×(t.r×tr.ZG+Zthv)=
0,913(240÷21)exp 2×(0,0025+j0,2999+(0,479+j34,555)
ZS=0,75+j67,313
Zsf=2,226+j67,313
I'm"s=CUnQ÷√3Zs=1,1×220÷√3(0,73+j67,313=0,023-j2,07s,
|Is|=2,08KA
Solutions.
Tree phase fault at F1.
-impedan e of transformer
ZTHV=Ukr÷100×urTHV÷srt=15÷100×240×240÷250=34,56
RTHV=PkrT×Ur.Ur×thv÷srt=15÷100×240×240÷250=0,479
XThv=√z.zthv-rthv.rthv=34,557 ohm.
ZThv=(0,479+j34,557)

-3.section 4 .
Purpose :
Power explain hand book
-basic network analysis /and advance field college. University explanation career
-instrumentation ,
-DC motor and generator ,
-transformers ,
-three -phase induction motor.
-single phase motors
-synchronouse machine.
-generation of electric power.
-Ovehead transmission lines on under ground cables .
-stationery batteries.
-electric energy economic method ,
-ligthing design.

Label drawing resistor groups

- explanation : serie -parallele DC circuit to be analysed:.
Combine all Serie Req=R1+R2+R3+...+En
DE=RB+R14=200+40=240 ohm ,Req, GG=

R7+R8=200+400=600 .ohm , Req ,=, R10+R11==400R.=//.
Req=R1//R2=R1.R2/R1+R2)
G.G=R5//R6=(1009×1500)/1000+500)=600 ohm.
Sum VD, E=VAB+VBC+VDE+VEF
460=60+100+50+120+130v
-computw the current ,V1=VAB+I1.R1, VBC =V2=V3,
VCF=E-(VAB+VBc)=460-(60+100)=30
IA=IT[RB/(RA+RB),
IB=IT[RA/RA+RB, ..
I5+I6=0,5/2=0,55=I5=0,25×(1500/2500)
____----------
Explain draw Motor source
-Id = Q c |VC|=1220 VAR (120v)=12
(0+j10,2).@ motor)=cos exp -1)×0,7=45.6
IM= 114.29 /_45.6 °=(10-j.10,2)
IT=IM+IC=(10-j10.2)+(0+j10,2)=10/_0°
100 percent factor capacitor installed in switched bank to provide a range of of correction
(S=P/cos)Teta=1200/0,7=1714.
S/|E|=(1714VA)(120V)=1429.
|.I| ×cos @=(1429A)(0,7)=10A.
QL=|E|I|.√1-cos.xos /_, reactive power factor ,
QL=(120)×(14,29).√1-(0,7)×(0,7)=1714×√o,51=1224 VAR
-Xc=VC.vc/Qc=(120)×(120/1224=11,76
C=1/wxc=1/(377)+1176=225,5

Purpose Explanation :Analysis of offset wave
Calculation average V avg= Vdx=T
T= period ,V avg =Vdx=[(12×1)-(8×1)]=2v
Vrm,v = √area[VT.t]/T=√(12×1) exo+(8×1) exp 2÷2=√104=10.2

-superposition theorem effect 20vdc, VC reached it final ,(steady-state) value
I=9,VR=I×R=0V,VC=20v ,effect of AC voltage (10.sin 377t) circuit ,XC =1/CW
=1/(377)(660×10 exp 6)=4 ohm ,Z=3-j4=5/_-53°
I=E÷Z=(0,707)(10)/_0°/5, /_-53°=1,414/_+53A
I'm=1,414/0,707=2A,
I=0+2sub(377+53°)
VR=I/R=(1,414/_53°)(3/_0°)=4,242/_53°
VR=0+6sin(377+53°)
VC=5.656/0,707=8. /_-37°, VC=5,656/0,07=8v
VC=20+8 sin (377t-37°)
V=√vdc .vdc +(vm1.vm1+....VM.vm)÷2
VM=|T|=√0.0+2.2=1441, |car|=√0.0+6.6/2=2,24
P=I.I×R=(1.414) exp 2×(3)=6v

-Explanation :
VR, 20 v , 10 sin 377t, c=660
W=2.π .f=(2)(3,1416)(60)=377.rad/s,,xL=1/(376)+26,5)×10 exp - 6
Z=R+j(xL-xc)=R+jxEQ,, XEq=xL-xc
Z=√R.R+XEq /_ tan exp -1(XEq/R=|z|/-0,,Z=100+j(188,5-109)=
√(100)(100)+(85,5(85,5)/100=133,5/_41,5°
-E= VR+jvl-jv =VR+JVC,,vx=vl-vc

Label drawing

-Explanation series parallel,RLC Serie parall Serie El,and RC ,,Z1,Z2
-I1=E/Zeq=100/_0° ÷1290/_224°=0,0775/_-22,°
Current rule I2=I1.Z3(Z2+Z3)=(0,0775/_-22,4°)
(100/$-36,9°)÷[500+j1200)+(800-j600)]=0,051/_-841°A,I3=I1Z2(Z2+Z3)=
(0,00775/_-22,4°)(1300÷67,4°)÷(500+j1200)(800-j600)]=0,0709/_202°

-Explanation.source =E=100v/_0°, load 1 ,P=200w,Qc=500v,, parallel load
2,pp=500w,QL=1200v,,
Triangle
Qxc=QL-QC=1200-500=700
S=√PT.PT+Qx.Qx=√700×700+700×700=
989,8

- explained maximum power transfer in AC circuit
Label series , source E 9v/_0°< pallele Z1=10/_53°,Z2=8/$90°,ZL
Statement of the maximum power apply thevenin circuit
ZThv=Z1.Z2(Z1+Z2)=(10/_-53°)(8/_90°÷(8/_90°)÷[6-j8)(j8)=13,3/_-37°ohn
ZThv=10,6+j8 ohm
R=10,6 ohm, xl=8 ohm ,ZL , 133/_-37°=10,6 ohm ,j8 ohm ,RL=106 ohm , ,XC=-8 ohm
ETH=EZ2(Z1+Z2)=(90/_0°)(8/_90°÷[(6-j8)+j8]=12/_90°v
Pmax=|ETh.ETh|÷4RL
Pmax =(12)(12)π(4)(10,6)=3,4w

Explain of a balanced wyE ,wyE system
VAn=120/$0°,V, Vbn=120/_-120°
Vcn=120/120°,ZA==zb=zc=12/$0°
IA=Van/ZA=120/0°,÷/_0°=10/_0°
IB=vbn÷zb=120/_-120°÷12/0°
IN=10/_0°+10/-120°+10/120°=0A
-analyse system balance ,
VAC =200/_0°, VBa,,200/_120°, VBc = 200/_120°, Zac=ZBA=zCB=4/_0°

Drawing diagram start start load source ..
Load current.
IAC= Vac÷zac=200/_0°4/_0°=50/_0°A
IBA=VBA/zBA=200/_120°/4/_0°
50/_120°A÷4/_0°=59/_-120°A
-solve line current
50/_120°=25+j43,3, Icb=50/_-120°
=25-j43,3)loS ,IA=Iac-I a
=(50+Jo)-(25+j43,3)=86,6/_43,3)-(-25-j43,3)=86,6/_-30°,A,IB=IB
IC=(-25+j43,3)-(-25-j433)=86,6/_-90°
-Ic=Icb-Iac=(-25-j43,3)-(50+Jo)=86,6/$-150° ..
_____
3..Drawing label balance, delta,

_____
3.1Explanation: instrument correct transformer line.

3.2 Explain : instrument connect transformer line
A,b,c to 3 p AC ,, RF=10k,R1=20k, Ref=10k,

. drawing labell

2×11×60=1320 ,u. Sec
RC=1/2×P1×RaC
11×60=660hz
C=2,411×E-8farad,
--_____
I=P(V×pf)=20,000/240×80)=104A,
1000,000/2400=41A,
50:5A rating,
Select potential ,2400V, step down ,120V, 20:1,connected 2400,
---
Drawing

Select current : 1500,00/1,73×1200)=72
-line -to-line ,12000V, 12000/120=100:1

_____
Vare enter selected varent ,
I line =300000(1,73×8300)=208A,,
25:5_-A
8300/1,73=4790,
4799/120=39,9A
-scale meter :
Teta ,cos exp-1,,0,8=36.9°
Reactive power=300.00×sin36,9°=300,000×0,6=180,000var

3.3 Explanation Metering internal wiring
-
Connecting a tree phase watthour ,meter with a demand register to power line ,
Drawing.

_____
Union College engineering emeritus

34Explanation DC motor and generator :
a=4, four pole ,lap wound machine constant k=N.p/aπ, N = 780/2 ,=39,
P=4 ,poles ,a=4, (390)(4)/(4π)=124,14,,k=124,14
-calculate the induced voltage function.
EA=, =k×flux×w×m×s,
Finding , 2/0,0397=35,2 rad / v.s
Calibration > EA/w.m=k.flux ,
(124,14)(0,32×10- exp 3 wb)=0,0397

3.4.1.explanation :calculate the speed calibration of the the voltmeter: EA/wm ,,
I/0,0397=25,2 rad / ,IV ,speed of 25,2 rad /s ,2 π rad , calibration , 25,2/2π,,um /s ,I-
V ,,,(r/s)(60/SM)
240 tr/Min
Draw labell
Field load
Terminal voltage ,V t=Ra-ILRa=260,8-(40A)(0,4) ohm=2449

-armature induced voltage
EA = 280v , at 1100r/Min ,
ea =(280)(950/1100)=242V
VT=EA=Is(Ra+Rs)=242V-(630)(0,02+0,0045 ohm =224,7
- explain moment inertia j
T= k2wo, k2=T/wo
{(2.40nm)/(183rad/s)=0,013

Tacc=j/DW/DT, k2Wo=jdw/St.
Integral x1=84 ,X2=0 dr= (j/k2). Integral , x 1=42 , X2=183 (I/w) dw
[t] ,84 to 0 = (j / 0,0013) (ln w) | 42, to 182
-j=(84)(0,013)/(ln42-ln183)=0,742 kg
-explanation calculation the time form dynamic breaking electromagnetic torque=K1.Ia,
IA=EA/(Ra+Rbr).k2w+k1.k1 ×w/5.29
Or,St=(5,29jdw)/(5,29k2w+k1.k2)
t=4,355

Drawing label

-three phase scr drive for DC , scr calculation average values, equation ,Vag=
(3×√3/2π)×V×cos s
V=(440/√3)√2=359,3V
S=40°,s Bag=0,827×cos,s=(0,827)(359.3)cos alph90°=227,6
S=45°, bag =(0,827)(359,3)(cos45°)=210,1
-conversion = 1100r/Min (πrd).m
60s=115,2
Const torque ,
- explanat ion
Calculate torque ,T=K×Ia,
(10hp)(746w/HP)/1208=35,9A
T=(33,00/0,738Lb,ft=64 7 n
K=I/Is=64,7N, m/35,9A)= ,1,8n.m/A
-ea=kwm, EA =(1,8V are)(115,2rad)
=208v,,EA=VT=Ia.Ra
IA=(2276,6-208)/0,42=46,
.T=k.Ia, 40°, T=(1,8Nm/A)(46,7a)
84,1Nm.,, 45° Fring an ,T=(1.8Nm/A)(5.0A)=9.N.m

Analysis of a transformer connected to loan.
3.5-explanation calculation moment inertia ,
T=
Armature=, poles
(0,75)×(12,4Ia)=9,3 armature field current IL=(0,048)(41,7A)=2,0A
R shunt field , RF = V1/If=240/2.0A=120
IA=IL+If=41,7A+2.0A=43,7A
IA.Ra=(0,0061)/(240v)=14,64V, Is =43,7
RA=14,64v/437A=0,335
_____
Full load IL motor ,IL = 5000w/240V=208
EA=Vf-Ra Is=240-(1.100ohm)(1.8A)=238V.
-pro(loss)=EA.ia=(238)(1,8)=428,42

IL+If,, VT=240,,V=ea-Ra(IL+If)
-starting
IA=IL-If=20A-5,2A=14,8A
Induced ,EA=V.t-Ia(Ra+Rat)=240
-(14,8A)(0,330 ohm+6,57 ohm)=137,9 V,
-test stat restricted
RST=(vt-ea)/Ia-Ra=
(240v-137,9v)/34.8A-0,330ohm=2,60 ohm
-ea= VT -Ia(Ra+RST)=240v-(14,8A)<0,330), 2,60=196,6
Rst2=(vt-ea)/Ia-Ra=240V-(14,8A)(0,330+0,917)=221,5
R1=Rst2=09,97.;; R2=Rst-rst2=260-0,917
=16,83 ohm ,, R3=Rst-Rsti
=6,57 ohm - 2,60 = 3.9
_explain , dynamic breaking for separe excited motor
T=33,00/P/2πn..
P= rating , n= speed ,T=(33,000).(7,5hp)
(2π×1750 tr/Min)= 22.Lb
1N.m /0,738Lb.ft=30,5 N.m
_____
Ia-Ia×.Ia .×Ra....Vt-2v
Calculation rotational losses rate speed ,.calculate initial break
2×3,5 N.m-2,40N, m=58,6
Torq=K1.Ia,,K 1=, I a = 240 m/.1,85=1,3

...

3.6Explain:calculate a procedure,.
-computw the number of primary and secondary turn ,
-N1=V1/V turn =2500/2,5V turn , =1000turn , similarly,n=v2,250/2,5 , turn ,
a=N1/N2=, 1000/100=,10:1

I1=(VA)/V1=25000VA/25000,V=10A,,I2=(VA)/V3,=25,00Va. /250
=100A,, I/a=I'm/I3,=10A/100A=1:10

Drawing labell: I1,,I2 ,zth =5k , Z1,, N 2,, ZL=8ohm,,
Thevenin , impedance.
Z1..5000ohm,, thevenin ZL
8.ohm ,a= √Z1/ZL=√5000 ÷8=25
,,25:1.
-a2= V1/V2=2000÷1000=2÷1, a 3 =V1÷V3,
2000÷500 V =4÷1.
-primairy ,I1,,, I2=V2/Z2..
I3=V3/Z3,,, I 2= 1000V÷500=20A,,, I 3= 5000V/50=10A.

-labell transfo , primary :V=20000,Z1,N1,, N2, N3, v2 = 1000, load Z 2=, 50 ohm ,,Z 3= 50 ohm

N1.I1=N2.I2+N3.I3,,solv.
I1=(N2/N1)I2+(N3/N1)I2,
N2/N1=1/a2,, N3/N1=I/a3.
I1=U2.Ia2+I3.Ia3=(20A(1/2)+(10A)(1/4)=12,5A
-
KVA = V1.I/1000=(2000V)(12,5A)/1000
=25kva , KVA ,= V2.I2/1000
=(1000V)(20A)/1000=20KVA,
KVA3=V3.I3/100=(500V)(10A)
.apparent ,25KVA =(20+5),KVA
-impedan e wind
Z1=a2.a2Z3||a3.a3.a3Z3, Z 2=(2)(2)(50)||
(4.4)(50 ohm)=200||800=160 ohm
Z1 found in step
Z1= V1/I1=2000V/12,5=160

-power requirements:
P1=P2+P3+.... Secondly ,
P1=5+2+10-3=20w
P1=V1.V1÷Z1,,
V1=√P1×Z1=√20×2000.=200v
V2=√5×6=5,48, V3=√2×2×8=4V
V4=√10×16=12,7v, V5=√3×500=38,7ohm
a=V1/V2=200/5.48=36,51
a3=V1/V3=200/4=50:1, a = V1..

3.4 Explain, circuit , Z 1= V1 200 , circuit ,Z2=6 ohm ,p= 5 w,Z2= 8 ohm ,z 4 =, 10,Z5= 500,,
-I 1 ,v 1= 4800v,S1=100,f=60hz,
-I 2 ,n 2 , 609 v load ,S2=,50kva
N3,480v, load ,S3=50kva

a2=V1/v2=N1/n2=4800/600=8:1
N2=N1/a2=800/8=100tirb
a3=V1/V3=N1/N3=4800/480=10:1
N3=N1/a3=800/10=80 turn
I1=(VA)1,/V=1000000/4800=20,83
I2=(Va)/v2=80000/500=83,8
I3=(vA)/V3=50000/480=104,2

Performance and analysis of transformer with a logging
Diagram phasor
R1=0,3 ohm ,x1=15, I 2,N1, X2=0,015
I1, RC,XM , v2,E2, load
-E1,I flux ,lag ,E 1,90°,power factor,R1/a.a,,x1/a a, Req=R1/a.a+R2.
Xeq2=x1/a.a+X2..
Zeq=Req+(jxEQ. jxeq)
a=V1/v2= 2400/240=10:1
Xeq2=(R1.|a.a+R2)+j(x1|a.a+X2)
=(0,3/100-0,003)+J(1,5/100+0,00)=0,03059/_78.69°>
|I2|=(vA)/V2=100.00/240=416,67
I2=416,67/_-36,87°
V1/a=V2+I2.Zeq2=
(416,67/_-36,87°)(0,03059/_78,69=249,69/_1,952°
|V1|=a|V1|a|=10×249.65=2496,5

3.7-explanation loss calculation.
10kva , transformer, 40w iron low ,160-w copper loss at full load efficient 5kva,80%
Pcu,=I1.I1.R1+I2.I2.R2.
Eff= pour/pin = pour/(pour+losses
=Pour/(pour+pin+pcu
=(Va load)(Of)[Va load)
Of+of+pxu ,(Va load) n rating
Efficient=5000×o,8)(500×0,8+40+16)
(5000/10000 ,exp 2)=0,98
-level max efficient
Pcu (KVA/ kV rating,
Efficiency= p out (pour+pi+pcu) = 5000(5000+40+40)94
All day efficient , 24h trans.
Loss is a total ,P.t

(180×24)/1000=4,32kw,
W cubtotal ,(1×1×620×8+0,5×0,5×620×5+0,25×0,25×620×7)/1000=6,006kw,,20h
-wloss=50×8+50×1/2.5+50×@/4×7=612,5kw.
----------_--------
Explain draw
Generator ,I1p connection l1
and l2 ,13kv, primary, secondary 138kv , ,load rated =50Mww,,delta start ,x1,n1

a=N1/N2=13.000/79,677=0,163,.I1s=a.I1.p√3=(0,163÷2221/√3=209...
Load { total KVA /√3=80kva/√3=46,2Kv
-46,2kva/40kva×100%=115,5%
=√3×40=69,3
=69,9kva/120kva,x100=57,7
----------+
Delta Delta connection,80 kV /√3=26,67kva,load ,=KVA,
= 46,2kva/26,67kva×100=173,2%

----------_
3.6 Explain phase induction motor ,
I1,r,1x 1, RC,XM ,E 1, v,1, i2,X2, E2,R2/s.
equivenlent diagram
Solutions.
1.fulk load shaft power = 15×746=,11,190 w mechanical power development (pm)=,shaft power friction ,I1,R1,X1, RC ,XM, I'2-I2/a,x'2=a.a,X2,R',R'2/s(1-s), R'2/s=a.aR2/s
Pm=11,190+820=12,010w.
2synchrouna speed (Na)=f/p,
Ns=60/2=30×60=1800 r/Min
Slip(s)=(ns-n)/Na
S=(1809-1710)÷1800=0,05
Air gap power (page)=Pm÷(1-s)
Pafg=12,010/(1-0,05)=12,642.
-rotor copper loss (pcu.pcu)=SPG
Pcu 2=0,05×12642,1=632,1
-no load test f=60hz,V=229,9,v =6,36A,P=5/2w,
-locked rotor test F1=15hz,v=24,I=24,06,P=721w,
-locked rotor test at f1=60hz,
I=110A,P=27,225w
Aveg,wind resis stator terminal=0,42ogm
No load test
|Znl|=VNl÷√3.INL=229,9/(1,73×6,36)=20,87 ohm
Rnl=Pnl/3nl=512/(3×6,35 exp 2)=4,22 ohm
Znl=√|znl| exp 2-Rc .exp #=√2a,86. Exp #-4.22 exp 2=20,44 ohm
Lock rotor test ,

Zin=V÷√3.I=24÷(1.732×24.06)=0,576 ohm
-R1+R'2=P÷3.I.I=721÷(3×24.06.exp 2)=0,415 ohm
X1=X'2=√zin.exp 2-(R1+R'2)exp 2
=√0,576 exp 2-0,415 .exp 2=0,404 ohm
To determine leakage ,60hz,
XL=(60÷15)(x'1+x'2)=60/15×o,403=1,616ohm
X1=0.3xl=0.3x1.616=0.485 ohm
X2=0.7xL=0.7xL=0.7×1.616=1.319ohm
. magnetic react
XM=Xnl-x1=20.44-0,485=19,955 ohm ,
PG=pnl-3.i.R1=27,225-3×110 exp × o,21= ,=19,602 w

3.7 Explanation:
-3÷188,5×(241,2)(241,2)×0,2÷1=185,2Nm
-R2'/S=0,2/0,0333=6,01ohm,
Z1=(0,25+j0,15)+(j30)(6,01+j0,5/6,01+j30,5)=0,25+j0,5+5,597+j1,596=6,2123/_19,7°
-Ifl=265,6/6,2123/_19,7=42,754/_-19,7°A
It's/IfL=245,9÷42,754=5,75, of =cos (19,7°)=0,94 log
-T=3÷188,5×+(261,3)(261,3)÷(0,49+0,5).exp ×6,01=163 , NM
Pag=Two.sin =163,11×188,5=30,746,2
-Rotor copper loss:
P2=sPag=0,033×30,746,2=1033,9w
P mech =(1-0,0333(×30.746,2=28,7223
Pour=Pmec-p rot=29,7223-1700=28,0223
Pin=3×.V1.×I1×cos flux.
=3×265,6×42,754×0,94=32,0024
Eff rotor = 28,0223÷32.022,4×100=87,5%
-effinte =(1-s)=1-0,033=0,967=96,7%
STmax=0,2/((0,24)(0,24)+(0,49+0,5)exp2)exp 1/2=0,1963
Tmax=3÷2×188,5.[(261,3)exp 2÷0,24+(0,24)(0,24)+(0,49+0,5)exp .2)exp 1/2=431,68N.m
-Tmax ÷TpL=431,68/163,11=2,65.

STmax=1-(R2/(Xm+X2)=1-(0,58÷(2,6+0,271)=0,98

Breaking

Labels
Drawing

WS=2πf/P=(2π×60)÷2=188,5 rad/s
TL=Pg÷ws=19,602÷188,5=104N.m
Resistance reactance.
R'2=(R1+R'2)-R1=0,415-0,204 .ohm
R=P÷3×I×I=27,225÷(3×110×110)=0,75 ohm
X=√z.z-R.R=√1.207×1.207-0,75×075=0,95 .ohm
X'2=X-X1=0,95-0,485=0,465 ohm
-Rotor at start
RfL=R-R1=0,75-0,21=0,54 ohm

-IEEE..test for empire
Reactance rotation|sQuire cage design|w
X1/XL : a 0,5: B;0,4;c 0,3;D 0,5
X2/XL
_____
-Performan e characteristics
Tech=1/w×3.V1.V1/✓R1+(R'2÷S)]exp 2+(X1+X'2)=R'2÷S
-AT low value of slip
Timex ~ I/was 3V1.v1/R'2×s
At .value of slip .
Timex ~I/Was.3×V1×V1/(X1+X2)exp 2=R'2/S
- Tmax = 1/2ws×3×v1v1/R1+√R1.R1+(X1+X'2)
-stator core rotor friction and wind ,
Loss ,Pag ,pin Elec ,pmec ,windage loss ,P out mec,stator resi loss (3.I1.I1.R1)
-3phase
I.a.V1=460×√3=265,6 V ,start ,S=1,the input impedance,
Z1=0,2+ -j30(0,2+j0,5)/0,2+-j30,5=1.08/_66°
The starting current
It's=265,6÷1,08/_66°=245,9/_-66°A.
Wayne=1800÷60×2π=188,5rad/s
Vth=265,6×(-j30,0)÷0,25+j30,5~261,3V
ZThv=-j30(0,25+j0,5/0,25+j30=0,55/_63,9°
=0,24j+j0,49
Rath=0,24ohn ,XTh=0,49 ~x .
It's=Pag÷wsyn=I2.×2R'2/S÷w.a
=3÷188,5×(261,3) exp 2÷(0,24+0,2)exp 2(0,49+0,5)× 0,2÷1=

3.9-explanation: .
1.select base value:
VA base =150MVA, vbase =13,8kv,,fbase = 60hz,value base,
2.calculate RMS stator phase current base ,Is base , Is (base) = (MVA base ×1009)(√3×Kv base)=(150)(1000)/√3(13,8=6276A,
3.)calculate peak stator phase current base ,U base , I (base) = √2×Is(base)=√2)×(6276)=8875A.
-4) calculat statore base impedance Z, ,base ,ZS (base)=KV..base / MVA base =13.8)exp 2/150=1,270 ohm
5) calculate base inductance ,La (base ,
La (base) =ZS=(base)/Abase=1270/377=3,37×10 exp -3
6)calculate field base impedance Zfd(base)
Zfd ,base = (Lad/LAFD ,base =(0,0056÷0,0138)×8876=3602A.
7)calculate field base impedance Zfd (base)
Zfd(base)=MVa base ×10 .exp 6÷id(base ,=150×10 .exp 6 =11,56
8)calculate field base inductance Lfd (base)
Lfd(base) = Zfd (base /w base = 11,56/377=30,66×10.exp-3 H
9) calculate field base voltage ,EF d base
10).calculate direct axes armortiaeur base current current is ks (base) lad / laks is base , =(0,0056/0,0054)+8876)=9204
11)calculate direct axis armortiaseur base inductance.
lkd(base)=Zkd(base)/wbase=1,77/377=4,70×10 exp -3 H
I Zk , direct axis armortiaseur base current
-12,). 1kd (base)(load/laks)(base)=(0,0056/0,0053)(8875)=9204A.
13) calculate quadrature - axis armortiaseur base inductance ,L,kq (base)
Lkq(base)=Zkq(base)/wb=1,77÷377=4,70×10. Exp -3
-350×10 exp 3 W-(399,8hp)(746w/HP)-44,186w=7563
-calculatiin of efficiency because
=+399,8hp)(746w/HP)(100%)/[399,8hp)(746whp)+44,186wt, 7563w]=85,2%
-calculate counter ,EMF
(Tuvr)-(resist volt drop) -(reactive voltage ,240 /_0°
(1580/_-38.1°A)(0,0177 ohm)-j(1580/_-38/A)(0,046 ohm)
=240-22.0+j17,3-44,9-449-449-j57,2=173,1j-j39,9=177,7/_13°

-14 calculate quadrature axis armortiaseur base impedance L.kq(base)
Lkq (base) = Zk(base)/wbase =2246/377=5,96×10 exp -3

16.calxulate base mutual inductance between armortiaseur and field Lfd base ,lfk base =
(ifs(base) / ikd (base) Lfd (base)=
(3602/9203)+30,66×10 exp -3)=12×10 exp -3H
17. Calculate base flux linkage flux ,base .
Flux (base) = La (base) is (base) = (3,37×10 exp - 3) ×8875=29,9wb

-calculate base rotation speed in r/term ,
Base speed is 120 f base ,IP = (120)+60/2)=3600r/Min
-calculate base torque ,t base ,
T base = (7,04 MVA base × 10) minimum base ,
= (7,04)(150)(10 exp 6) ÷ 3600=293 ,kLb ,ft (3972 kn.m)
_____
Calculate per - unit base Quantitie for a 150-Mva ,13,7kv,60 Hz ,3 ph two pole synchronisation machine following constant axis mutual inductance between,
Inductance between stator winding a and rotor ,L AFA = 0,0054H ,Q axis mutual inductance between rotor stator winding a and q axis armortiaseur,Lakq= 0,0963 H ,the per unit system and denote rotor
-calculate procedure:
1. Determine the speed at breakdown torque synchronous in speed is calculated from the equation n,sync= 129 f/p , r/Min where ,f frequently,in Hz and ,P= number of poles this) synchronisation=120(60)(1800)×4 ,at the point where the torque in percent breakdown torque is 109,the speed in percent of synchronisation torque is 100,the speed %, of synchronisation speed is thus the rotor ,speed is not= 0,80 synch=0,80)×(1800)=14400trm
-calculate the hors power at breakdown
The general equation)+HP Min) /33,000f.t,lb=(torque in lb, ,n rot in r/Min)/52521 ;
16°z,,Lb , 13 in = ift
-ho = (torque in o in) (n rot ,r/Min)÷1,008,403,2
HP=(torque in o .in)(n rot in r/ Min)×10 .exp -6 break down,
HP = (10,50z in) (1440r/ Min) ÷10 exp 6=15,12÷10 exp -3, how = 1512 ..
- repulsion motor , 24 slot the armature ,
Slot ° (24)+2)=48 coil
ZR=(3,5×10 exo -3 WB)(576 conductor)(3600r/Min)(2poles)/√2)+60hz, (2pharh)=85,5

-calculate the AC impedance of the rotor circuit.
-inductuve is calculated XL=WL=2πfL.
Frequency,L=inductance,XL=(2π)×(60)×(36×10.exp-3H)=13,5ohm
Impedance of the rotor circuit is R+jxl=2,7+j13,6 ohm =13,9/_78.8°

-IK,R,JXL,VL,,
Flux magnetic properties
T=K.flux.il..kflux ,
T state /IL=2,3N
m/3,6A=0,639wb

IL=VL/Z=120V ÷ 13,9=8,63A
-3.Calcul the AC starting torque
T=k.flux.IL, T start , ..k.flux.il=(1,53wb)(8,63a)=132.
4) calcul counter efn
EA=VL-IL.Z..IL..to , 85% first càlcul
-j48.1=|20.7/_-240V, repeat IL,24°, EA = 120°/_0°-(3,6/_-24°)+13,9/$78,8°)=120-50,04/$54,8°=120-28,8-j40,9
=91,2-j40,2=99,95/$-24,2, -24° remain
Pmec=EA.iL=(99,95)(3,6A)=359,8w
-VL lag VL, of ° cos 24,2°=0,912 from information ,
Pmech = VL×IL×cos-coppwr loss = VL×IL×cos-IL×IL×R=
(120v)(36A)(0,912)-(3,6A)(3,6)(2,7)=383,97-3499=359
359.8w. VL=120/_0°.
_____&&
Drawing label
Phasor diagram motor universal :
ea°99,95/_-242°V,
|IL.R|=972V.
IL°3.6/_-24,2°
--------_____
Repulsion motor drawing diagram

3.9.Explanation,
-J√3.V.V/XD.
roduis ,is RF=√3.√Emax /XD=
√3(10)×(1,85)÷1,78=1,8p.u
V=I.××o×p×u,
Local , o (-10×√3)÷1,78=0,-j 9,96
-3 calculate steady state.
Jv2÷2(1xe-1÷XD)=J/2(I÷0,4-1×1,78)=
J.o.96.
RL=roduis
=V2.V2(1÷Xe×1÷xd)=1÷2(1÷0,4+177)=1,53pu.

- 3.10 explanation: GENERATION REGULATION:
-Ea=0,00219,power factor =0,975 ,zero

-Calculate potier reactance,XP
So=E+√3×Ia×xp , from zero power factor,.Eo= voltage at not load E,I,S. Terminal , voltage in RD= RE+DE,, DE=√3×Ia×xp
XP= Is xp÷(VLL÷√3)=D.E÷VLL=DE÷RE=0,43Pu,
EP=1,175Pu.
-power output and power factor.
Calculate the maximum output ,power for an excitation increase of 20% for a 13,8KV ,eye ,connected generator having a synchronous impedance of 38ohm phase it is connected to an infinite bus and delivery ,3900A ,at unity power factor ,
-1 drawing phasor diagram, subscription indicate initial conditions , voltage vs ,the line -to-neutral Angle and between the phase voltage and phase current.

2 .calculat voltage behind synchronous reactance
E=(1X,)+1X)-V.V] exo 1/2 = [3900×3,8÷1000) exp 2 -(13,8÷√3)]exp 1/2=14,54 KV
3.calcul maximum power Pnax
Pmax=3.E.V.I.X ,,sin§=1 for maximum
Power ,20% higher excitation.
Pmax = [(3)(1.2)(14,53)(13,8÷√3÷3,8=110MW
-Calculate power factor,
Flux =E.I÷Xs=14,53÷(3,9)(3,8)=0,97

-per unit Quadrature axis reactance calculate the synchronous and substrasient per unit reactance for the quadrature axis of the machine in the first , additional data ,for the machine are ,q-axia armortiaseur ,self inductance L,K,Kq=0,0107H, and the ,q-axia Lak = 6,3×10 exp -3 ,
-calculate ,Law
From value obtained in the two previous,
IQ=Lq/La(base)=0,0058÷(3,37×10 exp -3)=1,72 pu.
-calculate .IQ
L.q=Law+L1=1,72+0,12=1,84
Calculate ,Lkkq and Lakq.
L.k.kq=L.k.q÷Lq(base)=0,0107÷(5,96×10 exo -3)=2,80 Pu ,
IA.kq÷(La.base)+ base) ÷Ikq(base)
=(6,3×10 exp -3)÷(3,37×10.rxp-3)(8876÷8172)=2,72pu

4)
Calcul per unit value of q-q ,axis armortiaseur leakage inductance ,IkQ ,1kq=1k.kq-ILq=180-1.72=0,08Pu

5).calculate per unit transient inductance.
Lq=Law.Lkq÷(Law+Lkq)+L1=(1,72)+0,08)÷(1,72+0,07)-0,12=0,195 Pu
- calculate if and ikd
The quantity are ,ifd rfs ,Zsd (base)=

0,0072÷11,56=6,23×10 exp-4, and Ikd= rkd÷Zkd base ,= 0,028÷1,77=0,0158pu
-calculate field open circuit time constant,T,ok
T'd=Lffd÷Ifd=1,74÷(6,23×10 exo -4)=2793,Pu
-calculate: substrasient open - circuit time constant,
I" o/o=(I/Iko)(Lkd+lfd.ladπlfdd)=
(1÷0,00157)(0,19+(008)(6,66÷1,741)]=16.9Pu
-Calcul per unit transient and subtransion short circuit time constant for the direct axis the direct axis armortiseur leakage,time constant ,
-calculate per unit transient short circuit time constant ,Ta
T'd=(I/FD)[Lfd+Li.los÷+Le+Lad)
[1÷6,23×10 exp -4)(0,08+(0,12)(1,66)/(0,012+166)]=308
-Calculate per unit substrasient short circuit time constant ,T" oO
1÷F.kd×[Ln+1÷(1/Lad)+(1/Lfd)+(1/L1)]
=1÷0,00158×0,19+1÷(1÷1,66)+(1÷0,08)+(1÷0,12)

- 3.calcul per unit armortiaseur leakage time constant ,Tkd, Tkd=Kkd÷Ikd=0,19÷0,158=12.pu
I/w(base)=1÷377, Y=T÷377

-phasor diagram synchronous generator
1.determine
If the Va and V base value are equal to the machine rating ,Is base =
(MVA)×1000)÷√3kv=(100)(1000)÷√3)(13,8)=4184 ,base voltage a ,13,8 kV ,per unit RMS , terminal voltage ,is Ei=1.0 Pu
Per unit peak voltage
Teta = U.O/$0°.P.u will be chosen ,phasor
2) local ,q- axis ,
EQ=|EQ|/§ machine internal power angle. EQ, ,,Eq° a+ j(r+ jxq), but ju = 1.0/$0° Pu,where, Teta = cos -1 , 0,8 = -36,9,,,EQ=1/_0°+1.0/_-36°×j1.84=2,38/_35° Pu power angle ,×=35°
- Calculation a frictional ,EQ=|EQ|/s.
-ea=|a|cos§=(1,0)(0,819)=0,818pu
ed=|a|.sin×=+1.0)(0,573)=0,574 .Pu and
Jq=|j1|.cos(§-teta)=1×0×cos(35°+36,9°)=0,311 ,Pu
JD=|j|.sub(×-0)=0,951.pu

-voltage ,E1, Q axis represents.
E1=Xad,j+d=eq-xd.is+rid=0,819+(1.89)(0,951)=257pu
- explain, Generatie - capabilities curve :
generator , supa ability curves , supplied the manufacture is used to determine the ability of generator to delivery real (Me) and reactive ,(MVar) power to a network determine the capability curve in per unit value of a generator
-characteristic : 989 KVA ,of = 0,85 synchronous reactance ,XD = 1,77 Pu , maximum value of generator internal voltage ,Emax =1,75 p.u terminal voltage ,V= 1.9 Pu ,§= load angle and

the system reactance external to generator ,is XE=0,4 .p.u
-calculate stator limited portion stator ,limited is directly proportional ,full power output ,arc ofa circle medium ,Rs=1,9 p.u
- calcul field - limited,P=(3×V.Emax/XD)
Sin§+j(√3.×C.E.max÷Xd.cos§-√3.V.÷XD)

Explanation:-Generation rating for installation:-generation rating in MVA = turbine rating in MW /power factor,generator for 600-MW=rating 600Mw /0,99=677MVA.-o

3.11 Explanation: calculate generator output ,P
Po= √3×KV×IA×pf=(√3)(25)(28.000)(0,975)=1.182,125kw
-calculate generator officiency
Efficiency=power out put)÷+power output+total losses)
=1.182,125÷(1.182,125+10.910=0,99
-calculate synchronisation coefficient at rated load for the following generator : 75.000kw , terminal voltage ,V=I×o×p×u, armature current,
IA=I×p×u,
Quadrature axes reactance ,X2=1,8 ×pu×
Of=0,80 lagging , neglected the resistive components of armature
- calculated rated load angles §
The angle §=tan .exp -1.[xq×cos$×Ia÷(Ia×xa×sin$+V)]
Tan .exp-1[1.8)(0,80)(1.0)÷[(1.0)(1,89)(0,6)+1]=35°
-calculate synchronising power coefficient,Pr
Or=(rates kW)÷(rates load angle × 2π÷360)=(75)(1000)÷(2π÷360)=122,780 kW/rad.

-Generation efficiency:
Determine the efficiency of generator having the same basic characteristics of the generator in the generator regulation additional data including armature full load current ,IA=28.000A ,core and short circuit losses a friction and windage ,loss ,500Kw ,from drive rotor input ,armature , resistance ,Ra=0,0011ohm phase excitation voltage a rates ,470C, excitation current for air gap line 3200A,and output voltage ,25 kV ,compute core loss from and the potier voltage So=1.175 ×p.u, loss 21000kw

-determine short circuit loss for 1.0 Pu line current ,short circuit loss =4700kw
-calculate stray current loss ,stray current ,loss =short - circuit ,loss , armature,loss =4700-862=3838Kw

- calcul power for excitation power for excitation=field voltage ×IfL
=(470)(2,4)(3200)÷1000=3610Kw, IFL

-Determine e total losses :
--friction and windage : 500kw
Core loss. : 2,100kw
Armature copper loss. : 862 kW
Stray current loss. : 3,838kw
Power for excitation. : 3,619kw
Total losses : 10,910kw

-Explain: Generator grounding transformer and resistor.
-determine the size of a transformer and resistor required to adequately provide a high resistance ground system for a Wye, delta start connected generated rated 1009MVA ,26KV ,60GZ,in addition generator capacitance= 1,27 ,if man transformer capacitance =0,12 if ,generator lead capacitance= 0,01uf and auxiliary transformer capacitance = 0,024uf

-calculate generator line -to -neutrak voltage ,VL- N=(26kv)÷√3=15kv
-calculate total capacitance ,CT
CT=to+1,27+0,12+0,01+0,024)if=1,424 uf .
- calculate total capacitve reactance ,Xct
XcT= 1÷2πfcT=1÷(6,28)(60)+1,424×10 exp -6)=1864 ohm
-select ,R= XcT to limit transient over voltage during a line _to_ ground fault assume a 19,92÷0,480Kv
Transformer the resistance reflected to the primary ,is .R'=N.N×R, R' is the requirements resistor ,solve ,R=R'B.N ,,, B= 19,92π0,480=41,5
R=1864÷41,5 exp 2=1,08 ohm

-calculate transformer secondary voltage ,Vs during a line - to - ground fault ,vs = Vs = 1500÷41,5=361V.

- calcul current Is , through grounded resistor ,Is° Vs÷R=351÷1,08=334,3A
-calcul required continuous rating ,in KVA grounds transformer rating is KVA ,= I,V, = (334,3)(361)=120,7kva.
- sele

- explain:selected short time rated transformer from ANSI standards ,a50 -kva transformer may be used 9 Min , rating is adequate,

-calculate generator line -to -ground fault current ,If , if = V/XcT =15.000÷1864 =8.05
-Power -factor improvement.
An industrial plant has a 500-hp induction motor load a 4000V, with an average power factor of 0,8 logging ,and a erage motor efficient of 90% ,A new synchronous motor rates at 3000hp is installed to replace on equivenlent load of induction motor the synchronous motor efficient determine the synchronous motor current and power factor for a system current if 80%od the original system and unity power factor
- calculate initial system rating KVA
The rating is KVA=(HP /b)(0,745/of)=(500/0,8)/(0,746/0,8)=518KVA,,n efficiency
- calcul initial system current I o
Io=0,8Ii°(0,7)(746)=597A
-neq induction - motor ,I1
I1=0,746 hob/. √3.n.pf =(0,746)(200)/√3(3)(0,9)(0,8)=299A,
- cal synchronous - motor power factor ,- PFA = 3588/40/1=0,895
-calculate synchronous motor power factor PFA , PFS = 358,8/401,1=0,895
Related calcul verification synchronous rotor horse ,3000hob,,,ho's=3×V×I×n×pf/0,746= (√3)(4)(401,1)(0,895)/0,746=3000hp

-

me
- 3.14. explanation: design calculation: autotransformer starting;

Labell drawing:

Alpha= voltage tap = VLA ÷Vs
ILA= alpha / LA = motor ,
ILL=alpha /ILA= aloha K1= Line current for

= Alpha, I1+0,15In for (a) motor torque

-ZL= total input impedance
ZL=motor impedance
Rs=starter resistance
ILR=motor current .

Motor locked rocked rotor resistance
ILR=VLR÷ZL=alpha.VL÷ZL=IL
|Z×IL| I=I×RL+jxl, I=VL÷IR=VL÷alpha×IL
=(Z/alpha) Ohm
-RiL=Rs+RL=√Z exp 2×IL- XL.exp 2
R.S = (RiL-RL)
Of = cos (Teta) = RiL + ZIL

-multi step starrting :
. drawing:

R'2/Smart/
-Rx1=Rmax
-Rx2=S1.R2.Rx4=S1.Rx3
-Rx4=S1.Rx5
rx1=Rx1-Rx2=
Rx.z=rx2-rx3
Rx3=-rx4..

-speed control operating supply,
Tm1÷Tm2=S1÷S2÷4
Tf1÷Tf2=N1. Exp2/n2 .exp 2 =(1-s1) exp 2/ 1- S2) expb
Impedance motor
XL=WL, r+jxl, T= k ,flux,L,, T = k.flux
-Po=√3×Kv×A×pf

-e valuation of annual O ,M cost Vs installed capitals cost

Cost component | unit A. | Unit B.

-Net unit heat rate .|10,55 MJ/kWh| ..-/-
-unit availability. |10.00 but kWh| -/-
-unit rating. | 95%| -/-
-installed capit cost| 600Mn| -/-
- levelized average | 18.00 % | -/-

-for annual fixed
Charge (9450×10 ,exp)(118/100)=18709×10.exp ,6
Annual fixed charge
Annual cost used for compare

91,69×10 ,exp 10 ,exp 6
- cost penalty

-3.14. Explanation :Overhead transmission line and under ground cables :
-calculate flux one conductor

-Inductive impedance
©
©. ©
- transmission line geometry portion
Diagram
.
-effect of mutual flux line.

- charge two conduct .
..Is , RK, K ,IR

Long lines Vs = VR+IRZe),expb+(VR-IR-Ze)e .expb along
Is=+VR/Zc+IR)exp + (VR/ Ze - IR) ,exp ,e - alpha e
Zc= √ Z/y- ,, propagation cost ,,
Alpha = = √ Z.y , per kilometre .

- calculating sending voltage for (200 m transmission line receiving to - line voltage ,is 239 kV ,and the is 200 at power factor ,0,8 logging promote ,R=0,2 ohm , L = 2 MH , C = 0,01 if , f = 60 Hz
Determine YL , and ZL ,
.TL = hw × CL × 1/km .1=jb×77(0,01)(19 exp -6)/km×320km= j.1206 micros sub(micro second)
ZL=RL/km×1+XL/km.×1=0,2 ohm/kn(329km)+377(2)(10 exp -3) ohm / km × 329 km =-6,4+j241,3ohm

-capacitance of two wire line :
E=P×L/2

-Capacitance of two -wire line
E=P×L÷2×π×€×r
Vab=(resistivity ×length÷2×π×€) Ln(b÷a)
E=(resistivity ×Length÷2×π÷€)[1÷r-1÷(D-r)].V/m
r>a ,center
-V1.r=(resistivity ×Kength÷2×π×€)ln[r(D-a)÷a(D-r)].C
-D>a ,V÷2=(resistivity ×Length÷π×€)Ln(D÷a)×V
-C'=q÷V,, Q= resistivity ×length ,,
C=C'/Lor,C ,,π÷Ln(D÷a), f/m

-find capacitance to neutral for conductor transmission line ,if = D=8ft×(2,4m),a=0,25 in
(0,0°625)
Length of line is @0m.(16km), frequency is 377 Rod
-ZC=1÷w×c , substitute for ,X=0,0388 ,log (D÷a) obtain
-XC=1÷(377)(0,0388)(@0)÷log (2,4÷0,00625)]=0,0026 M,

-phase quadrature components
,start motor ,
VL= 120°/_0°, phasorw locked rotor ,Is=8,4/_-145°
A=8,13-j2,10A , similarly

In= 12,64/_-40,0° ,A = 9,69-j8,18
In phase = 8,13+9,69=17,82A
Iquad ,= -j2,10-j8,13=-j10,23A
I star= 17,82-j10,23A=20,55/_29°
Pfact start = cos 29°,86=0,867
T,start = k.Im.sin.a
=(0,18V,s/A)(0,4A)(12,05).sin 25
=8,46V

ZA=Za×bZ×Ca÷Zav-Zbc+Zc
Zb=Zab.Zbc÷Zab+Zbc+Zca
Zc=Zbc.Zco÷Zab+zbc+Zca

Zab=Zab+ZbZc+ZcZ2÷Zc
Zbc=Zazb+Zb.Zc+ZcZc÷za
Zca=Zazb+Zb.zc+Zc.iz÷zb

(Xa.zb+xb.xc+XC.xa)÷xc
zbc=(xa.xb+xb.xc+XC.xa)÷xa
XB.xc+XC.xa)÷xb
Xa=Zab.xca÷xab+xbc+xca
XC=xbcxca÷xab+xbc+xca

Labell
Generator ,12,2 kV, x"=0,19pu,50.000kva

Motor 1: 30000KVA,X"=0,29per ,,4,2kv
Motor 2: 20.000kva,X"=0,25. , 2,2 kV
-tfo :
Primary : 13,2kv,: 50MVA,,,
Secondary: 4,2kv, 30MVA,,
Tertairw :2,2kv,,20Mv

Label ,R'j0,68,,,L2=10,012; ,j0,002, equivalent,0,034
Correct motor reactance ,X" motor ,0,2 base ,30.000kva , 4,2kv,
(0,20)(50,000/30000)(4,2/13,2)Exp 2=0,034Pa,
X" load 2, 20000Kva , 2,2kv
(0,25)(50,000/20.000)(2,2/13,2).exo 2=0,017
Calculation of complex power ,P+jQ
Balanced 3 phase, ..
5.0/_-37°, line voltage ,is
69/_0°,per unit base of ,10000KVa and 72 kV,,

- design drawings ,

.lx. Matrix
|0. 1. 1 |

|1/_60°. 0. J |
|1/_120° -1. J|
_____=0,863/_191,67°
|1. 1. 1|
|-1. 0. J|
|0. -1. J

Explanation-Electric -power network
2generator. // :13,2kv , and ,13,2166, sending bus ,6,6kv ,,Tertia ,transfo motor , 7,5kv , and transfo 66 kV /12 kV , output ,6motor M1,M2,M3,M4,M5,M6, 0f 12 kV parallel ,,

Labell , circuit generator with tree impedance Serie ,j0,101,,j0,03, j0,10 line and transfo two motor Ma,MB ,impedance ,j 0,222,,,h0,333
_____
Explanation
Generator 1=40.000kv, 13,2kv,,X"=0,20
Generator 2=30000kv, X"=0,25 Pu
Transformer=75,000Kv , 13,2kv,, 66,kV, x = Pu

_____
Calculate , impedance :3000kva ,
Jxtotal=(j0,15)(j0,25)÷(j0,15+0,25)+(j0,04=0,134pu

_____
Generator react .
X"=(0,25)(3000/300000)=0,24pu
30.000kva,, X"=(0,25)(75,000)/300000=0,625pu
Transfo reactance ,
X=(0,1)(30,000/75.500)=0,04 ohm py
30.000kva ,base

3.14. -explanation: Phase shift in Wye Delta.H2=B,, IBH2=A,IA,IAn,,,Generator
GA ,line ,motor 0ne,ZB=0,6+j0,77 GB -ZA=15+j1,5 ohm
O=√3.E/ne.IL×cos,P=E×I×cosIA=PA÷EA×c

-explanation:
-Bus iV^,, Is, Vs,, Vy^, bus j ,,I pi,you, IPS ,,
-find slack bus power PG, ,i-j
Yn=Is+Ipr(v1-vy)ys+V1.p1

-Power,
Sn=Pn+jQn=V1.In=V1(V1y-Vj)y+|y1|.y1|.yP1.
Sjn=Pjn+jQj=Vy.Iy=By(V1x-V1)us+|Vy|.yP1.
-Power loads in line (1-j)
Slip=Sij+Syi
-Talor
f(x)=f(a)+(x-a).df÷dx|+(x-a).n÷2!×d.df÷dx|+....+(X-a).expn÷n!×d n exp f ÷dx. Exn +Rn.
df÷dx|a=,
Value derivatives evaluation x =a,
Serie converges if , Lim ,n to inf .Rn=0
Non linear.
-f1(x1,X3,.....xn)=y1
-f2(x1,X2,.....xn)=y2
-fn(x1,X2.....xn)=Yn.
FK(x1,X2,.....xn)=y, k=1,2,3..

|y1_f1(X1,°X2°....Xn°|
|y2_f2(X1°,X2°....Xn°|=
|yn-fn(X1°,X2,.....Xn|

|df1÷dx1|x1°df1÷dx2|x2°...df1÷dxn|Xn°|
|df2÷dx1|x1°df2÷dx1|x2...° df2÷dxn|xn°|
|dfn÷dx1|x1°dfn÷dx2|x(°).dfn÷dn|Xn|=
[ΔX1]
[ΔX2]
[Δxn]

[Δu]°=[j]°[Δx]°
[Δx]=(oji°)exp 1 [Δu]
[X], =[x]°+[Δx]°
[x]•=[x]exp k +[Δx] .k

-newton- raphasor , method applied to power flow

P1=sum ,n ,k=1,|V1||VK||yik|.cos(§k-§1+ aphk)= f1p.
Q1= -sum,n,k=1|V1||VK||y1.k|.sin (k-§1+alph ok)=
I = 2...

-transformers regulation determined from short circuit test ,
-% regulation = [V input - V output) V input) [100%](2300-2236)÷23000](100%=2,78%
Single phase load current, KVA = V.I÷1000=apparently,
I= 10000kva /v=(1000)(5)/23000=2,17A
Test ,of = of = W÷VA=of=90÷66)(2,17)=0,628
Lagging, cos -1,= 0,628=Teta =51,1°, cos 0,80=Teta,369°

- transfo output voltage for serving ,0,80 of load rated ,VIR = VSS cos (Teta - load) 66,cos (51,1°-36,9°)=66cos,|14,2°=64,0 where Vs = short circuit , impedance phase angle ,Ix ,, VIX=Vsc.sin(Teta 11-teta load)=,66sin 14,3°=16,2, V input = (Voutput + ViR),exo 2+(VIX)=2300,exo 2= (Voutput + 64)exp 2+ 16,2 exp 2 = 2236 V ,

-induct of two wire transmission
©<----D---+->© , lM day °(u÷2π)[1/4+lnD/a)WB
Turns / m ,, L= lamb /1.. L=(2×10,exp-7)
[1/4+ln(D/a).H/m, inductance ,L may be expected,
L= (2×10 exo 7) Ln (D/r) r ' = a ,
LR = 2 L = (4 × 10 ,expb-7) ,LT° 1,482×log(S/r')

-
...

[

-3.15.explanation: two wire ; 10mi(16,1km),two transmission wher ,D= 8ft(2,44m), a=0,1n(2,54mm),at a frequency of 60hz , 377 rods /s ,
- geometric mean raduis GMR ,r'=0,7788)(2,54×10×10 .exo -3)=0,0019780,
Calculate LT=(4×10 .exob-7) ln(D/r)=(4×10 .exp -6) ln (2,44/10.001978)=28,5×10,exp
-reactance XL=(377)(28,5×10 exp -7)ln(2,44/0,001978(=28,5×10 ,exp-7hm)(16,1×10ezo ,3)=173

-1.©|<------D'11---------->©1'
2©|----D22'----->©2'
3©---------->D33<----------©3'

Lamb=(u/2π)(I/3)[1/4+ln(S11.Ia)+ln(S12.Ia)+ln(D13.Ia)-ln(D12.Ia)-ln(D13.Ia
D11= lamb 11=(u1/2π)ln[D11,D12,D13) ,exp 1/3/(r'D13DB)1/3
-insuctan e , L1=lamb/(1/3)=(3×2×10×10,exo -7)lb(D11.D12.D23)1/3÷(r'D12.D23)1/3
L2=lamb 2/(1/3)=(3×2×10,exp-7)ln(D21,D22,D23),exob@/3÷(r'.D12.D23)1/3]
L3=lamb 3/+1/3=(3×2×10.exo -7) ln (D31,D32,D,33)1/3(r',D23,D13)1/3].HM
Lavg=(L1+L2+K3)3 and ,L1+K2+K3)9H/m
-LT=(2×10,exp-7)(lb[D11,D12,D13)+D21,D22,D23)(D31,D32,D33]exp -1/8÷r .exp
3.S12.D13.exo 2,D13, exp D ....
©
©. ©

Xa=(2×10 exp -7)(3([1/4Ia+IaIn.D12/a+lbD13.Ia+IB.lbD21/a+IC.ln D 31.Ia)+(1/4.Ia+IA .ln
D21./a+IA ln.d23/a].IV.lnD32.a+IC ln DD12/a)+(1/4Ia+IaInD23/a+IA.lnD3+Ia-
Ib.lnD13/a+IclnD23/a).IA,Ib,Ic
RMS,phase ,IA+IB+IC=,,D12=D21,D23=,vS 13= D32,
Lamb,a=+2×10.exp -7)(Is)/(3)ln(D12.D23)/a.a.a+3/4].Qb turn/
-L.dlux=(2×10 .exp -7[ln(D12,D13,D23),expb1/3÷r'],H/n

©<----------->©<----------->,© calcul ,
3,6m. 3,6m
1. 2. 3

L ,flux(2×10,exob-6).ln(3,5×7÷3,6).exp 1)3÷0,01=12,2×10,exo -6 ,H/m
Calcul inductive reaction
XL=377×12,2×10 exo -6,H/m × 1600m= 0,64 ohm

a1©-----D------© c2
V1©---------Db1.b2--------©
C1©. ©a2
GND=(Do1b1,Da1.b2.Da@.adb,D/a, db1,) expb1,

-aluminuim conductor steel reinforcement (ACSR(
-code|size|alum|out| resisC,|phase to n
Word| mil | aton|

Complex penetration depth
Drawing

o=√p/(jw), self impedance Zn,
Z,,=R1+JW×.uo÷2π×ln×2(N1+o)÷(GMR1,,,
JW,uo÷2π.ln.

Mutual impedance:
Zk=JW.yi÷2π.Lb.Djk÷Dk..
Dik=√(h-hk).exo +DL.dl.k

|ΔVu|. |[Zu][Zug] [Ky]
=
|Δvg|. [zu][zgf] [ig].
-voltage drop growing wire ,[Δvg]=0,
Zu÷zgg÷[u]

Drawing label:
Size conductor in wire solid ,scale 250,ruler ,/2,8 ,,
- reactance ohm scaling ruler ,1100, correction for multi conductor cable , single conductor in conductor in core , multiple conduct,.
.-aur earth , conductor core ,insulator

|Δv1a|. |Z11a, z12a,0,0,0, 0|. |Ia. |
|Δv2a| =|z12a,z22,0,Zab,9zac|. |I2a|
Δv1b	.	0, 0, z11b,z12,0 0.	.	I1b
Δv2b	.	0, Zab, z12b, z22b, zb		I2b
ΔV1c	.	0. ,0, 0. Z11A, z12		I1c
Δv2c	.	0,Zac , oBx , z12,Z1,		I2,c

-Δv1=ΔV,core - Δ v hearth ,,
-ΔV2= Δ V sheath
-I1= I core ,
-I2=I2 heath core ,
Z11A= z core out + z core / shear insulation+ Z sheath,
Z22= Z2 sheath out + z shear /earth insulation+z
Z12=-Z - sheath - mutual
-zab = z mutual earth - return on,
-zac = z mutual earth , return ,AC
Zbc = z mutual earth ,return .

Z mutual earth return
=Jwu÷2π{ln(aloha ×m×d÷2)+1/2-2/3ml
-cable buried ,M=√wju÷p

3.16 Explain : balanced charging 230Kv, 3Pg , transmission reactance ,0,2 m.pohn ,mi phase(0,32 ohm ,the line ,is 80 mi (28,7km)Lo
XC= 0,32÷28,7=0,0924m ohm
For voltage - in neutral , 239 × √3= 133kv , charge IC, (10 ,exp 3)(0,0925×10 exo 6)=53,2A

3.16. Explain:Data required: composition of EHv , transmission line -fault ----------
----------|types | 765 | WHV comp | 115KVOf

-substation ,Bus ,CA350,F2,,CBL0004
500, CBL-400, 2000A, CBLO,,1000A,
Feeder, diagram showing ,I Raley =Iprimairt÷NCT=1000A÷120=8,33A,

-Differential current fault extremely
600:5,CT,Rd,, 41,7A,,,7000,,58,3,,,100A,relay ,

-bus fault,
VCT=excitation volr ,
If=current ,.Ncf=current ratio
R lead =0ne,wayle,
KP=2,
RCT=current

_____
Sect 3.,
COGENERATION:
-Power output developed by turbine stages ,
-generator and mechanical losses , B
-Boiler feed and consent pump power conscience gross and fuel heat rate ,feed water heat balance .

Gas turbine based cogeneration plant ,gas turbine.

-superheater yes boiler yes steam generator,,
Steam turbine ,process steam extraction , separator yes , generator yes , feed water heater , condense , condenser.
-cogeeneration plant
-output : kj /kWh (Vtu/kWh), heat rate =(Q1-Q2)÷P
-Q1=cogeneration plant ,, Q2=conditional steam generator
-compressor , combust , heater recovery steam , dearect , condensation return ,feed water

- cogeneration plant cycle based on turbine as the primary expression efficiency =(P+H)÷Q1,plan

-Calculate procedure , divide into sections.
- calculation total power output in each section section power output =W1.ΔH1/3600,where .
W1=steam flow through section in kg /h (Lb/h,ΔH , enthalpy drop across section in kj /kg (Vtu/LB
3.calculate total power output,
Total power output =sum ,n ,t=w1,ΔH1,/360

-rehearer. Yes 349435kg/h 3336kj/k,boiler superheater 389687 ,,
Steam generation , Sja 2383kg/h,
High pressure turb, intermediate pressure turbine, low pression turbine 1,14MPa,159444kg/h,; 3245 kj/ yes ,process system ,,700kw, 1200kw,, mechanical generator ,, 94100kw generator,
389,687 kg/h , 1041kj,,, OTTD,Fw6, 5,5 DCS ,,822,9 KJ ,,, 0TTD fws ,5,5, process steam ,, 0,62 MPA 6748,, 2,8 TTD FW ,,4772kg , 355,6 KJ ,2,8TT ,FW ,, 2,8 TT fw, condenser

-STCP heat balance for 94-Mw generator ,SjAE= process plant steam jet ,air ejector ,P= MPa , measure ,pressure ,H =KJ/kg

...

-3.18 explanatjon :Electric energy economic method:

-regulated environment
-theory of the firm, P=f[Q],stating
-production costing
- project selected,,
-framework energy market step
1 regulation ,yes standard compliance reliability security =yes, iso yes , supplies yes primary, transmission yes , distribution Tess , exchange yes commodity cash future planing yes market brokers contract search ,
-P=f[A],
-Revenue (R)for compagny use expanse capital expense operating expenses is easy, R=P.Q
-supplies , capital cost operation maintenance, individual suppliers curves work product cost .
(CP),,capital cost (k)
CP=g(k)+h(Cr)
Marginal cost production
(MCp) Derivatives of the cost production ,
MCp =dcp/dQ,
-Average cost production ,
(ACP)-Ia the cost ,ACp=P/Q
-total products cost indirect ,IL=R-Cp
Price , demand, supplies, supplies actual price , competitive, qualities,

-Ed=-(P ×.dq)÷dP×Q)
Ed>1, demand is constantly,
Cost of money,
Find weight cost ,IB°I0,percent
Stock interest rate ,IP=12% and return on common stock ,IC =15 ,percent , preferred stack, IC = 15 percent , fraction of bonds ,DR=50%, fraction stock CR=35%, prefferes stock , ratios fract preferres stock , PR = 15%

_ computer the cost of money the weight cost money (I)
I=iV.DR+IP.R+icCR=
I=(10)+0,5)+(11)(0,15)+(15)(0,359=12,05%

-equivalent and compound interest. cash flow (f),future value (P)%,rate of inflation (I,I) for future period (j) future period payment (n),
P=f÷[(1+i.i)..(I+in)]

-simplifie ,
P=f÷[1+I).exp]
Annuity = P=a(1/1)[(1+I)exp n -1]/([1+I),exp ,n
Inom =(1+1eff),exp ,m-1
I.eff=exp(Inom)-2), discount,

,sum of years digital depreciation ,cash flow,

---_---
-data declined balance
---_---
Year| remaining| annual. |accumulated
|Balance|. Depreciation | depreciatio
---_---_---
1. |1,0. |0,40. |0,4
2.
3.
_____
Income stat for share holder
_____
Revenue 25000
Operating expenses. $350
Interest. 300
Depreciation. 600
Income tax 420
Total expense. $1675
Net. Income. 853
._____

-find breaker even loading between units value $ 17,55/mwg is found at 40 Me loadt onunit A,and $ 18,00/MWh is found at a 6 MW loading level on unit C ..

Data. |Unit A|. unit B | unit. C

Full load Mw. |50. |35. | 16
Heat rate. |1200 | 12500| 13,500
But/kW. |11,375|11,849|12,323.
Fuel price G , |1,50|. 2,09| 1,50
$MBTu. |1,58| 2,11|1,58.
Minimum loadMw|13 |. 10| 4
Incremental Hr
Minimum load kj/kWh ,10,550|11,100|11,
50% load kj /kWh |11,280|11,100,|111
100%loaskj/kW, 12,00| 12,500|13,00
Incremental fuel cost
Minimum load $ MWh ,15,84. |22,4|17,55
50%load $ MWh. 16,92 | 23,75 | 18,72
100%load $ MWh 18,00|25,00|19,0
---_---

Loading schedule for unit A,B, and

- system load | fuel cost | unit a|unit|unit

27. | 15,87. | 13. | 10| 4
39 | 16,92| 24 | 10|4

...

[

-3.20 . explain : find loading , daily load factor,ration of the load energy is in the the day to the energy represented by the daily peak dsmt multiplied by 24h fund the daily load factor LfD, when the daily - load energy is ,21GWH and the daily peak demand is 1000MW ,

- Multiply the peak demand by ,24 h (1000)(24) = 24,000 MWH =24,GWH,
- Determine the daily load factor LFD = 21GWH/24, GWH=0,875

-Annual load factor, annual peak demand, multiple by 8760 , estimate the annual load , factor demand daily,
LFA=LFD=0,875, motion the annual load factor demand daily,
LFA=LFD=0,875, motion average daily peak load to monthly peak load ,RwM =0,85 , motion of a average, monthly peak load to annual peak load RMA = 0,8

-LFA=LfD.RwM.RMA=(0,875)(0,85)(0,8)=0,595

-load management , purpose direct energy usage away from peak load period , method peak , sensitive rate structure and automatic control of power consumption load diversity find the annual load factor LFA ,when average , daily peak load is reduced ,5%
from ,1000MW,to 950 MW , assume RwM=0,85 and RMA=0,8

-find energy associated with 950 MW for 24 h ,the energy is (959)(24)=22,800Mwh
Find resulting annual load factor with a daily load energy 0f, 21,000Mwh

LFA=LFD.RwM.RMA=(21,000/22,800)(0,85)(0,8)=0,62

-cosr stored energy available charging by conversion efficiency 70%,unit energy for discharge CDC=,
.-force outage rate ,generating unit that operated 6650 ,in one year 350h ,force outages and 1860 on schedules shut down ,
=For=FOH/(FOH+FOH=,force outage hour, ,,SH = service hours subtitut ,,
350÷(350+6650)=0,05=5%

-Energy available storage is (6)(50)(057)=210MWH
Savings from operating storage (SsT),for 18,9 Mila ,kWh,, displacement energy at 35 mils / kWh is
-Sst =210j(35-18,9)=$3381
Cost , discharge
_____

Plan. |plant cost| levelized fixe|total fixe
|$kw per y| 0, kWh per yr| y
_____
A,
B,
C,
_____
.-investment tax credit =(3000)(0,10)=$300, income taxes ,
Generate income statement to share holder .

-Revenie. 25000
-Operating expenses
-interest depreciation
-depreciatiob
Income tax
Total payable
Net income

Project selected ,rate of return / minimum attractive rate of return cash flow is method to estimate interested rate equivenlent for cash loan ,be purchased for $ 1500 with $500 down payment , assume that friend
- Amount barround , $15000
10, percent interest 2yr , $ 300
Bank's charge for arranging the $20
Total. $ 1800
Monthly payment. $ 1800/24=$75,85

-cash flow stream> +$1500 month and -$75,83 each month 2 to 24
2solve interested rate using present value for annual ratio founded
-75.83(P/a) exp .I..indice 24=7583(1/I)[1+I)[1+I].exp 24, 1j/[(1+I)= ,exp ,24 =1500
(P/a) exp.I . Indixe.24=1500/74,83=19,78
Assume an interest rate , I=2%
Error interest rate , €=19,78-18,91=0,87
find , errors,I=1,5%
€=19,78-20,03=0,25
0,87,indice ,I - 1,305=0,5-0,25i
I=1,612%
€=19,78-77=0,01,,1,612%

-data for cacul levilized cost
Year |annual cost | present value| Pres v
-. |$. |Factory. | P($
. |. [I/(+I). Exp .n
1. 400. |0,9091. |363,64.
2. 600. |0,8264. | 495,84
3. 800. 0,7513. 601,04
4. 1000, 0,6330. 682.00
5. 1200 0,620 745 ,08
_____
288,60..find accumulated depreciation each years
,sum j.d =[(1+I).exo -1]/[1+1).exp -1],, ¥.j=I.....n
n=2, accumulation is [(1+0,1)]/[(1+0,5).exp 5-1]=0,34398,
-annual depreciation expense,.dn=[i(1+I).exp n-1]/[1+1),exp n -1),, n=2, dn =[o,1(1.1)
exp ,2-1]/[(1.1).exp 5-1]=0,18018

...

Explain: stationary batteries : 20Vdc, 1,2Vdc, current sizing constant power load 10kw , will be 116,lead acid battery with a nominal 1215 design , electrolyte for entire duty cycle ,-calculation

1.open circuit voltage,start of open discharge.
Eoc=0,84+specific gravity
Eoc=0,84+(1215/1000)=2,055
2.)det >> average volt per cell during discharge.
=(2,05+1,81)/2=1,93Vpc
-
3)det average battery voltage ,
=1,93×116cell=223,9Vdc
4) compute the current at ,
1=1000w ,1223,9V=44,7a DC ,
Rated calculation
-DC input kW ,: rated ,100kva ,at 0,8 power factor ,of 0,91 ,, eff sizing
KVA × of ,, 87,9

-10000/1,81×116)=47,6idc ,, Nicol ,, negative
Positive plate =1,/2
Current positive plover ,,:1,75,,a 25°c ,4 positive ,plate ×70amp /positive =280A, DC

-number of cells 48 volt system (42-vdc to. 56_ vdc maximum.

- compute a cell nominal lead cell , 2.0 vdc number ,cell 48/2=4 cell
- check minimum voltage line ,= V.lim /cell=(min.volt) /number of cells
42V÷24cell=1,75 /cell

-incorect size .
Cell size (positive plate) ,
= Maximum ,s=N,, s=1,, sum .P=s,,O=1..Ap-A(P-1)÷R.t

-sizing batteries.,ampere capacity, energy electricity economic method ,data cost of electricity calculation.

-LIGTHING DESIGN:

Luminaire,height ,90°,
Pitagore triangle ,D,H,point
E=(Cd)(cos45°)/(14,14)(14,14)
E=14,14 foot candle ,
E=(Cd)(cos ,3teta)/MH.h
-food candles ,candle power /distance

E=average illuminance foot candle
N=total number of lamp luminance constitute
LL=rated lumen output lamp ,

LF= light loss foot ,
BF=ballast factor
TF=till factor
A=lightef area .

Find the level illuminance.
500lux (50fc)
750lux (FC)
Lamp: lumen rating,LX (maintenance)=1/2(L.L area ,750 LX ,
750=1/2(LL/4.).exo 2 ,=24,00LL,=24,00
Height LL=54.,00Lm,A 400w,40000lumen LLD,of ,,0,77

-layout out door lightning ,40w,- high pressure sodium, 20m ,wide × 40m long ,10m,pole 40m

...

3.20Explain : assumed power output =94,100kw,operating ,,KVA= assumed power output/power factor
=94,1000kw/0,85=111,00kva ,generating ,=operating ,,kva×1,1=(111,00kva)(1)=122,000kva,
-mechanical losses =700kw , generator loss =
operating ,(KVA)(k1)/100.k2=(111,1000kvs)(1)/(100)(1,0)=1200kw
K1=1,1.....K2.

-cher h value of generator power output generator output (94,1000kw)+ mechanical losses (700kw)+losses(1200kw)=96,00kw

-boiler feed and condensate pump.
Pump calcul power , kW=enthalpy increase across the pump ,(KJ/kg)×mass flow (kg/s) base value ,
ΔH=694,3-6748=19,5kj/kg,,
W=9959+164,5321
159445+55,752=398,687,,,

BFP=(19,5kj/kg)(389,687kg/h)
(3600kj/kWh)=211kw,

-condensator pump ΔH=172,6-171,7=0,9/kg
W=139,223+22,977+2383=164,583 kg/h
CP=6,9kj/kg (154,583kg/h)/(3600kj/kWh)=41kw
-det power consumption of elect motor
Electric motor power consumption = 41kw÷0,85=48,5kw total cp

- gross power output , sum turbine section power outcomes mechanical generator loss - losses ,
96,000-700-1200=94,100kw
-net power ,gross power output - internal plan ,power consumption,

-feed water heater ,heater balance.
Write , balance for heater , 5×x line (4)×(100-line (8)]/100,line (6)×line (4)+(line (I)×line =line(I)×line(3)+(x+line(6), procedure is summarised,x =17,888kg

3.21 Explain:Lighting system for an indoor industrial area:

-a lighting system need design for a metal working shop area of the shop ,,12 m (50 ft)×60 m (200ft) conversation
---
Typical| typical| PCC|80|70|50|30|10|0
Lumin |intensi |PW|. |. | | |. |.
| Dist. |RcR|eff=|dn|up|lamp

LOw by| |
with
drop

High. |.
Bay
Open
Metal

Reflec

High
Bay
Open
Metal

Industrial while
,2×4,3 lamp trafficking

3.22 Explain: comparison of commonly used lamp type (HID type ,based on 400 - w ,size,
Lamp| initial|rate|lamp|Cu| burning| minut
| Lme|life| lumen| | posi|warp,hot
|Per. | |LLD|

Incad|20 |.100|0,89|high| any|0, o,,very,
Scent

Mercure|52,5|24.00|0,80|med|5-7, 3-6

Fluorescent|80|18.00|0,85|any,|0,0 low

Metal hol | 85-100|2000|0,75-80|higth

Sodium | 125. | 24,00 | ,0,90 | high ,any ,

Explain,
Characteristics of some popular lamp type
---__
Lamp type. | Initial | mean | rated | lumina

Incandesce| 320|. | 750 | 200
200W,A2
Insit frost
500. ,120V
500, 120v
1000,
1500, 130

Fluorescent|2950|2800|2000|6
Energy
saving

48-in
32wt8
---
9 Mercure
Phosphor
Called

Metal. | 41,00| 31.200|20.00|460
Holid
400w, 37
Clear

High
Pressure
Sodium
250 W,ED 18| 28.000|27000|24000|295

Explain:

LIGHT System for an out door area ,
Main height,
- highest illumination level produced away from a flood light location occurs when the maximum flood light candela value ,,
-3. Determine utilisation factor.
Area ,2 mainting height (2×10m=20m)
Height (4×10m=40m)long flood light is aimed ,13/10,

X÷MH=tan @÷cosπ

-Aiming line ,
Vertical angle , in line distance , maintenance,

-Lateral distance (x)÷maintenance (MH)

-foot candles /10.00 candelas ,
Mounting height =31,6ft,
Lux /10000 candle mounting height =10m
- calculat the level illumination
Average lux = (LL)(cu)(LLD)/area =(51.00)(0,4168)×(0,9)(0,95)1(20)(40)=22,7lx
-maximum averag Luz ,30,600w

Lumen distribution ,- isocandela , curves ,, photometric data for flood light in out

door ,agree light design

Factor to consider : level for activity luminaire.
- light -loss factor light loss factor ,
-level of illumination, extensive information on selected appropriate
-ligthing source selection cost of energy to operate light .
-coefficient of utlization (cu) the coefficient of utlization important factor ,
- deternationof illumination categories

Level

A.public space. 30lx(FC)
B.simple orientation. 50lx(5fc)
for short visit
C.working space 100lz(10fc)
where simple
visual

Common visual task visual performance task commercial residential applications recommend
---
D. Performance of visual task of high contractor and large size. 300lx
E.performance of visual task high contrast
F.performance of visual task of flow contract ,500Lx(50fc),,,, 1000Lx (100fc)

G. Performance of visual task near
3.000 to 1000lx , 300to 1000fc
---_--_-
Point is long aiming line is located 63°,or 2MH,this point is between the 0,8 - LX and ,1.0 line ,so the value ,0,9 can be give point a is ,10° above the aiming,point of 53° this matches the isocandela curve ,marked 400,the candela value this problem ,400, substituting , formula point a yield ,
-lux = (0,9)(400/1000)(90.000/1000)(0,88)(0,95)(1)=27,0lx
Point B,is located at horizontal angle of ,42 and the vertical angle is ,10° substitute in the formula,
Lux =(0,38)(400/1000)(90000/1000)(0,88)(0,95)(1)=11,5lx
,point c

-Roadway ligthning system:
Information already that street width is 20m the mounting height is 12m and the over hand of the luminaire is 2m the required overage maintenance level of illumination is 16 LX it necessary to. To determine the stagger spacing required to determine t staggered spacing ,require to provide the specific illumination level as well as the uniformity bof

illumination with.

- explain. mounting height used in chart is 10 m to calculate the level of illumination at any point following
Lux=[lux(from chart)](Cd/1000)(LL)/(LF)(LLF)(MHct)
-lux (from chart) =illumination in LX /100cd
-cd=candela value taken from the photometric data isocandela curves at the same horizontal and vertical angle as indicated by the chart must be corrected by dividing by 1000)

-total lumens falling on outdoors area lighting system.

Vertical. |. Horizontal angle
Zone | 0-10|.10-20|30-40|40-50|60-70-to
----------_----------
0-10. | 13,9.|14,6|13,9|8,1|. 58,6
0-10. | 19. 53,8
10-20|6. 37,2
20-30 |4. 27,3
30-40. |3. 18,4
40-50|. 2. 11,1
50-60 | 0,5. 0,5. 0,5.
Total right side. 208,4
Left side. 208,4
Total lumen 416,8
Total lamp lumen 1000
_____&
Estimated
LF=lamp factor , which correct the lamp lumens used photometric data to the rated lumens used in the flood light in this case LF=S1,
LLf=light loss factor = lamp lumen depreciation times luminaire dirt depreciation
MHCF= mounting height correction factor ratio of the square of the mounting used in chart height used of the mounting use in chart height used in the problem in this case , MHCF=100/MH.H=100/100=1)

-luminaire shape of the room ,reflectance of the room surface factor coefficient type , sample table for six commonly,
+- 10% recommend value ,
-purpoae ratio ligthning system , function of cavity ratio
- section ceiling cavity ,CCR=5hcc(Lrw)/Les ,room cavity ratio ,RCR=5hRc(L+W)/Lw
FCR=5hfc(L+w)/lWs ,,

Industrial location and task(0)
Very important some ,blank = not important or applicable,
-weding
-orientatiin
-pieciasion Manuel AC
- inspection of work after
- Manuel craft
- cutting ,pressing
Design ,issue: apperence and Lyman , daylight integration,direct glare ,flicker on stroble,intrinsic ,flicker ,ligth distribution, light, luminance of 100, reflected faces object v,reflected , shadow,source task,note special

...

[

On Thu, 06 Jun 2024, 22:19 tshingombe fiston, > wrote: -E and w for 250-w ,HP's lamp,KL°28,00lm ligth loss factor for roadway ligth l

3.22 -explain : illumination at test point P1and P2

Contributing|. rate for test point
Luminaire | transverse|longitudinal|illum
| ration. |Motion. |

P1. ,P2, P1, P2. ,P 1, P2

A. ,1,5. 1,5. 3,75, 5 ,0,88 0,6

B.
C
D. 0,167 0,61. 3,75. Tot 0,78

Minimum illumination value of 0,6 Luz occurs at point value is the initial value per ,1000 lamp lumens to convert to the actual maintenance illumination level use lux .
Lux = [LX /(Min) (LL / 1000)(LLD) (LLD)(MHCF) maintence height correction factor vMHCF Cana read from chart
Find (06)(28,000/100)(0,73)(0,93)(0,69)=7,87lx , average to minimum illumination level is therefore ,16/7.87=2.03:1 max

4.

Section engineering 4.

- job design explanation:SPU
Duty
Design : calculation for electrical design ,
SPU: design standards and guidelines:
-4.1 introduction standard , established minimum guidelines requirements Generating electrical on project electrical
-load calculation conductor sizing, conduit sizing ,motor branch circuit sizing ,power factor improvement, transformer primary and secondary circuit sizing, voltage drop,motor starting voltage Dipa ,short circuit analysis , ligthning level , grounding ,in substation where step potential are of concern , harmonic distortion analysis, cable pulling calculation ,generator capabilities motor starting.

-software :the electrical, design engineering SPU, approved software tools are :
-SKM power tools window software,basic tools Doppler load curt voltage drop , conductor sizing harmonic analysis ,size ,and several power switch energy.
-center one available from Rockwell automation for laying out motor control centre , spreadsheet may also used

-Calculation for electrical design:

Calculati|desc|required|Req|cond|Eng|ph

| |Tool|

Load |load. |skm|. |. |. |. |. 30/60/9
Facility. | each|ptw|
Switch. |load | dapee|
Gear. |Center: per net determine bus |protective devices circuit size
---
Load| load on each|
Panel|panel board|
board|NEC to set to determine panel, circuit any transformer

Generator,| to size |car,koheler
Sizing| base on calcul on critical run and star run and start load
---
Short |available fault|skm ptw dapper
Circuit|current at each bus to determine equipment short circuit interrupting rating
---
Conductor| to sizing circt
breaker| breakers and fuses |table hand

sizing|

Conduit| to size conduit and cable tray per NEC

fill
Tray size |.
_____
Transient| for starting
Motor. | Large motor
Starting|large determine

VFD, | for motor | 90cent
Reflective| from VFD
Wave

Lighting| may be performed specif
Protection|
Strike|
Distance|

- note suggested tools for use in SPu.
Projects

4.2.responsible party contractor -provided calculation may design engt - provide criteria
4.3.required conditionally requirements
4.4.basic requirements for electrical calculation
- non computer generated calculation must be on standard calculation sheet with the heading completed filled out
-calculation generated by computer programs must conform with the following procedure
-includ all heading information on each sheet ,
-insert comments wherever possibly to clarify to concept and actions taker in the compi input
- provide clear documentation of electrical geometry support conditions load application and load requirements,
-where practical , provide sketch of model indicated nodes , material , connectivity
- provide electronic copy on CD or other suitable device of analysis input and output with hard copy calcul
-provided manual checks of pertaining resultat.
.-coding liquid radiation force air ,
- voltage regulation: maximum allowable voltage dips
- operation prime standard
-voltage rating voltage ,non linear power factor with diversity multiple step of

-basic electrical engineering
Description: volts V=I×R,,power ,P=V×I,,P=I.I.×R
-AC single phase :
Volt ,= V= I×Z ,power factor ,of=cos π
Apprent power VA=V×I,reactive power VAR=V×I×sinπ
Real power=,,W=V×I×pf,,phase Angle ,Teta = arts (w/VARS)
-Power , phase angt ,Teta art (w/VARs)
Power factor , of = w/ (V×I)=w/A
-voltage drop ,Vd° 2×(I×R×cosπ+I.xsinπ)
Vs= voltage drop in circuit ,sin π= load reactive factor,
X= reactance
-AC , 3phase : KVA = (V×i×√3),,
KVA=√kw.kw+kvar.kvar
Real power ,kW= KVA ×cos, reactive power ,= kvar = kva×sinπ
Vs= voltage drop in circuit ,sin π=load reactive factor ,
X= reactance.

Motor , 2 horse power = 746 watts
- conditions a motor control centre with a total connected horse power 337hp CA be assumed to requirements ,337 KVA of input power conservation value large motor
Torque = (HP × 5250)/ revolution per minute (rpm)
Fan go ° (cubic feet per minute [CFM]×presure)/(3300×eff)

Pump ho = (gallon per minute [GPM] ×heas×specific gravity /(3960×eff) .motors (single phase .
HP=(v×i×eff×pf)/746
...

-4.6 explan ,HP= (v×i×√3×eff×pf÷746)
-sizs the capacitor need to increase the power factor from Pf1 to Pf2 with the initial KVA ,,
KVAR=KVA×(√1-pf1.pf1-pf1/pf2
×√1-pf2.pf2)
- load calculation sizing NEC 229,430 feeder conductor and protective devices , transformer panel board and switch board main busses motor control centre components service entrance device and conductor,
-load calculation must include all load ,the should be made by summing all of the load using appropriate diversity factor allowed by NEC art 229 ,that are connected to each panel board , switch board ,and motor control centre ,an allowance must be made for future load , growth the load for each branch of distribution system can the summed ,back to the service

-Generation sizing : software generator single or multi sets must be sized to supply maximum starting (SKVA),stead - state running (RkVA) and non linear (Gkw) demand of connected and future electrical equipment.
- information critical to the sizing and selecting.
-det include.
- environmental conditions elevation temperature indoor , outdoor
Noise obtatement requirements , muffler , enclosure silent ,
- fuel diesel gasoline nature gas
- fuel storage skid mounted tank ,day and remote tank
-
4.7 Explain conductor size ,general:
-general purpose branch circuit and feeders. ,art 220
-service entrance conductor ,art 239
-motore circuit. ,art 430
-air conditioning equipment. ,art 440

-generator. ,art 445
-transformers (primary and sect
-capacitor

4.8 Explain general requirements: sizing conductor two step process .
1.step is to look at the temperature rating of the terminal ampacuty of conductor be used match temperature rating.
2.the second step to look at the effect of ambient temperature conductor derative factor ampacuty
-inaulator used to cover wiring rated maximum temperature continuous , standard rating are 60,75°,90°,and 105°, current carrying capacity conductor.
-croas -section of the conductor , insulation temperature rating ambient temperature, copper 90°, test lab switchboard panel.
-load rated 43A, conduct containing conductor load running area ambient temperature high 42°, conductor are ,to copper THHN/RHWN insulation
Ampacity required=continuous board ×125% or 53,75 amp ,6 awg copper conductor Havit ampacity of amps correct terminal the circuit breaker services load houtsw , 31-16 , applied max. Temperature exceed 30°c ,
- Ampacity 6 conductor (THHN/THWN ,wet 75° Colum)=65amp
- corrected ampacity = 65 ×correctiin factor (82)=65×82,
53,3amo

Load of 200kva existing at 480V, with a power factor of 80% determine the amount of capacitor requirements factor to 95% =of=kva÷real power (kW)

-sizing procedure generator single multiset.
- prepare a load schedule,enter individual load characteristics in software,enter load in step sequence in software enter load in step sequence in software
-have software calculation
eff=efficiency,FLA = full load Amp ,GKw=non linear kW of connected load (s),LRA=locked rollor amp.
RPF=running me of connected load,RMA, reduce motor , starting factor ,SKVA=starting KVA of connected load (s),Skw=Starting kW of connected load (s) spf =starting power factor of connected load.

-resisti e loads : SKVA=RVA=Skw=Rkw
-ligthing loads (except for HD) ,SKVA=Skw÷Spf, RkVA =Rkw=RPF
-GID, ligthning loads = ,SKVA =0,75×RkvA, Skw=0,75×Rkw
-motor loads :SKVA=NEMA ×hp×746÷eff×spd×10000
-motor load 3-phaae) SKVA ,= LRA ×VL-Vl×√3÷1000)
VfD: Rkw=(drive -namwplate (HP)×646÷eff×1000
RkvA=drive -namw plate (HP)×746÷eff×pd×1000

SKVA = drive - name plate (÷eff
V.fD: Gkw=2.0Rkw
UOS: SKW=(ups-name plate (kW)+battery charging (kW)
RW=ups - name plate (kW)+battery charging (kW)÷eff
-ups GKW ,(3pulse) =2,50 §Rkw
Gkw(6pulse)=1,40×Rkw
Gkw(12pulse) 1.59×Rkw
10.reduced voltage motor starting SKVA=skva÷ RMs f
...

[

-Kva at initial power factor =√(KVA).(KVA)-(kW)(kW)=√(KVA)(kV)-(kva×pf)exp2,
KVAR=√(200kva)exp2-(160kw)exp2,kvar=√40000-25600=120,00kva
KVAR @95% power factor = √kw÷pf)exp.2-(kW) exp2-(kW).exp 2
√kvar =√(160÷95),exp-(160)exp,,
KVAR = √28,366-(25,600=52,6
-requires kvar for correction=120-52,6=67.4 kvar
-nec 460-8 criteria must met when sizing branch circuit conductor to capacitor first the ampacity of the conductor must be at least 135 the rated current of the conductor must be at least 135% the rated current of the capacitor second,if the capacitor are connected to motor circt the conductor to the capacitor should have an ampacity not loss than on third the ampacity of the motor
branch circuit conductor , capacitor rates amps=15÷(48×√3)=18
-branch circuit amp =18×1,35=24,4minimum ,motor branch circuit amp =1.25×77=96,25
N0 I,AawG at 110Amp a 1/3 of motor branch circuit ampacity =110/3=36,7Amp.

- 4.7. explain transformers: primary secondary,art 450,600v, nominal electrical system design nominal,feeder breaker , sizing 250%
-Assume ,45Kva ,3phase ,480 v , primairy 208/20,
-primairy full load Amp ,45kva ÷((480v×1,73)÷1000)=54,2Am
Fe

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Regards

CSD Contact Centre

This is to confirm that an incident was logged On: 2025/04/15 7:53:21 AM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za 7:53 AM (2 hours ago)

to me

Dear Tshingombe Fiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**2164585**
Summary:	Re: This is to confirm that an incident was logged On: 2024/06/24 2:35:45 PM (UTC 02:00) - Africa/Johannesburg
Customer Name:	Tshingombe Fiston
Location:	
Priority:	3
Status:	Logged
Category:	

Description

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On Mon, Jun 24, 2024, 14:36 > wrote:
Dear Tshingombe Fiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #

1901049

Summary:

Re: letter explanation theoretical pratical base work , n diplomat award engineering electrical

Customer Name:

Tshingombe Fiston

Location:

Priority:

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Status:

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Category:

Description

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Let's chat

On Sun, Jun 23, 2024 at 3:07 PM tshingombe fiston > wrote:
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May 29, 2024, 6:26 PM

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Room 506_012 312 5440

To:St peace college and instituts, tvet Dhet
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_____

-1. To concerne
This letter serves confirm .Mr was participations in the work integrated learning programme of department : Dhet research assessment irregularity national examination nated n4 to additional information and workbased on visited circular practice external on line job work practice on department of energy minimal compagny career CVS and industrial portal council work city power day visited on line Facebook,Gmail badges,Eskom career day 28day appointment,sarb career engineering artisan electrical electronics engineering,Microsoft Scheiner career certificate training, Eaton electrical dtic day project engineering ,sasseta saps psira career mil engineering career metropolitan
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-Computer and information management system in education learn engineering assessment police and safety 1,and engineering safety security.class orientation guidelines./technical documentation libraries engineering learn.
Outcome career subject entry irregularite time table revisit , irregularite career material illegal job material induction mentorship subject trading entry subject trade electrical theory , industrial electronics , mathematics, engineering,electrotechnic , industrial orientation science engineering drawing n1,n4,n3,n2,n5,n6,nstudie career experience exhibition electrician wiring

panel,code ,generator power station transmission engineering subject irregularite career policing subject detective , business studies career ,advance field research electrical career lecture asssessor senior trade theories lecture irregularite engineering trade , module week material AC DC courent mesure instrument , exhibition career power station plant theory sum AC +DC machine +instrument measure to evaluate generator , transmission career job and advanced continued assessment framework qualifications compagny,summarise module subject math , engineering science draw .

-1.1Section one

_____

1.2 Assist in the capture /profiling of job application career portal log activities on line internet project data development engineer path azure GitHub Microsoft autocad Autodesk Microsoft
-engineering design analyse.kheta advice national career ,investigation system visual studio development.ms office . engineering electrical automate programmation computing trade theory assessment subject time table allocation topics.enginering drawing n autocad topics relate nated Eaton assessment
2.typing of memos and minutes exam papers topics assessment self assessment draw sharp table engineering electrical planing.
1.2.design of reporting template: tableexcell ups engineering electrical software.
-management and training assessment panel wiring electrical
-assiste with headling career filing .
-capturing of career information system.database recruitment informers investigation electrical data source reports.career portal advices .
-sorting distribution files information management system Education irregularite database system Portofilio.
-allocated consultation and information record management system database assessment.engineering
-handing inquired admnise communication skill , orientation industrial design template attandance registration on line form visual basic ,excell ms word .
-relation labour handing of Portofilio survey interpretation status ..
-duty monitoring assessment moderator asssessor engineering electrical n studies and level irregularite material suspension transcript marksheet years .
Staff, daily staff delegation compilation of duty .
-monitor
-filing of retrieval of engineering assessment transcript record instituts saqa college topics project azure back log ..hrs practitioner..

_____

1.3.library and information service :sciebono career center and St peace college info class re rwiten
"Engineering science career" ,

-research process : reseach method plan and disc ,collected and collected capture analyse collaborate and create management store preserve share and publish assessment textbook topic, monitoring and evaluation,emerging qualitative and quantitative missing text book engineering electrical.
-research methodology engineering electrical topics vs research triangle.qualitarive methods quantitative methods ethnographic participate observations studies depth description engineering communication source data engineering ethnographic r group, participate research involving esearch case studies engineering electrical,source.
-textual critical in social engineering,survey aim to provide overview,
-experimental design laboratory controlled conditions physic psychometric technical ,field natural experimental design ,aim to provide a board of a representative sample of large .
-secondary data analysis using existing data it aim.
-conceptual analyse meaning of ward or concept clarification theory buildings on role building studies,literature review studies .
-types of qualitative research design ground theory research narrative.hiatorical case studies and phenomenology design engineering field.
-grounded theory is systematic procedure of data analysis typically associated.phenological studies design engineering electrical,case study research advanced field,
-wath are research method in library data collection first is to choose a suitable methode for collecting primarily data depending reseach topics objectives methode interview observations and case subject..
-step of library research process identify and development topics do preliminary locate material evaluation make note ,rwiten papper ,import method for data collection ,survey quantitative interview library.
.1.4.1.technical documentation in simple steps: business files and data during operation documents size store career control access keeps record and analysis career outline engineering step on line save download day part time learning.
-consider a degree or certificate.
-develoo skill on experience.
-primairy :collecting record work clerk retrieved engineering career .
-cataligi g data files and digitalise create file documentation organisation job engineering research analysis thing .technical knowledge soft ward .help desk technician types customer service , responding to customer support inquiries and documents feedback from customers .Google it support rating .
-research faculty teach and learning research lab learning environment clinical simulation practice of simulation teach to develop outcome student team work communication self assessment, simulation base education la assessment,task training task oriented , simulation lab ,booking Education technologie, engineering science career electrical module engineering board

-work purpose lab work conduct of experience,prepare work ,note book, of log book prepare rwiten engineering general format engineering, introduction theory procedure methode ,result vocational career trading guidelines.

_____

2. Section two.

Department energy mineralogie compagni ,Eskom
-related minimum experience.
Technical experience and engineering related technologies, skill and competencies leader .
-knowledge: relate technologie design codes and standards , engineering theory relevant processes ,police guidelines and legislation engineering design.
-technical problem solving co technical cost analysis presentation.
Key responsibilities , resolve complex integrated engineering problem variations integrate life cycle plan for .
Provide special engineering,advice assistant manager engineering projects modification.perform technical and financial evaluation

-Power Serie books on line research team future of power engineering lie experience engineering. Topics
Application post :28days booking confirmation shared successful or unsuccessful.plant generation substation power station transmission metering post megawatts financial .

-planing design construction of overhead power line principle system planning .insulation .
_fundamental and practice of overhead line maintence . theory of overhead line management topics , implementation of work sole inspection
-practical guide to outdoor council engineering high voltage characteristics electrical test specific flowchart inspector.
-theory design maintence and life management of power transformer,theory principle and practices of design , fabrication overhead power line structure of towers moves and diagrams.
-power line tower one testing .
-transmission theory design and performance role ,in electrical design ,AC DC, ,hybrid,loss may , economic DC line conductor , conductor charge .
-thermodynamic for students practicing engineering under thermo essential for power plant design and volume , outline key thermodynamics,
Princit steam and plant compressor refrigeration plant entropy engineering to design thermal fluid machine theory to plant operating and new design is
-applied system dynamics with south Africa case studies system methodology for

studies manàge change over relief respect flow accumulation material control the flow industrial.

-practionner and sustainable mentorship and coaching book

- 2.2 .purpose career explanation : course customers training manufacture execution scheineder electric PLC introduction to PLC level 1, ecostruxure control exper programming level 2,intermediate introduction machine ,ecostruxure process expert hybrid process, supervisor control 2data acquisition software configuration workspace situation , network connectivity control ethernet io ,human machine HMI programmation, telemetry truo licensed radio remote connect ,
-motore control introduction to variable drives altivart process system ,low voltage electrical distribution l.v.e.d ,SPD ,surge protection device ,on demand.
-low voltage low voltage distribution l.v.e SPD ,medium voltage permet set , medium voltage electrical distribution m.v.e, electrical novice ,
Ecostruxure power monitor expert power monitor project deployment
-explanation diagram: note technical
(Ups stream) , yes (USC %) ,=yes HV (transformer rating)=yes ,(power factor coincidence duty factor fore seable expense),(yes load rating).
(Conductor charabke ,busbars,length, width, thickness,cables, type insulation, single core, length,cross section, environment,ambient temperature, installation method,number of,) Yes,,(ISc at transformer terminal)yes ,,ISC LV switchboard out goes)yes : (ISC switch board outage ,yes head of final switchboard yes),ISC end final), (breaking capacity,) yes(SST and install trip sitting yes) ,(breaking capacity yes , St and strip ,(breaking capacity St ms, final .
-explanation: calculation impedance of power source the up streav network the power supply transformers as well as of the electrical lines
Problem consider a 20kv network that supplies a HV / LV substation via 2 m overhead line and MVA generator that supplies in parallel the busbare of the same substation two 1000kva parallel connected transformers euply the LV,busbar which in turn supply 29out gears to 20 motor including the one supplying motor .all motor are rate 50kw all connections cable are identical and all motor are running when the fault occurs the isc3a d up value must be calculated at the variouse fault location indicated in the network diagram.

-point A on the HV busbars with a negligible impedance.
-point B on the LV busbar,at a distance of meter from the transformer.
-Point c on the busbar of an LV su distribution board .
-point D at the terminal of motor Mthen the reverse current of the motor must be calculated at C and B .
up then D ,A

_____

Upstream network
U1=20Kv, SCC=500MVA , overhead line,3 cable ,50mm , copper length=20km,
2). Generator, 1MVA ,xsub =15%,t
3) transformer , 1000KVA secondary winding 237/410 ,USC=5%
-mIn LV switchboard 3 bars ,400mm sqr /ph copper , length=10m,
-cable @,3 single core cable 400mm aluminium spaced laid flat length =80m,
-Lv sub -distri utilisation board neglected the length of the busbar,
-cable ,3 single core cable 35 mm sqr copper 3,phase length=30m ,
-motore

Drawing 1.

Reactance x and resistance are calculated with respective voltage in the installation relative impedance
-solution :

Section. |Calculation. |. Result x,R

20KV
1.upstream network|Zup=(29×10 exp3)exp2×10 exp 6.(1)
Xup=9,97 zup (2)
. | X(ohm) (R(ohm)
Rup=0,2zup env 0,2 xup
X=0,78 ohm
R=0,15 ohm

2.over head line |XCo=0,4×2 (7)
|RCo=0.018×2000÷50
X=o.8.
R=0,15ohm

3.generator | XG=15÷100×(20×10exp)÷100.

-RG=0,1XG

20KV fault A. X(m.ohm) R(m ohm)

4.transformer | Zt=1/2×5/100×410 exp2/19 exp
Zt on LV side | XT ~ZT.
Rt~ 9,2

410v

5.circuit break | . Xcb =0,15 ,15 ,,0,15

6.busbars one busbars | xB=0,15×10 exp -3 ×10
X=4,2, and R°0,84

RB=0,023×10÷400..
One 400mm .sqr bar
X=1,5 m ohm
R=0,5

Fault B
7.circuit breaker | xcb=0,15
R=0,15

8.cable.1
One 409 mm cable
Per phase |xc1=0,15×10 exp -3×80 |
Rc2 = 9,923×30÷35....,,

Fault c
9.circuit break ,xcb=0,15.....

Fault D
11motor 50kw |xm=25÷10×410 exp2/5010.9×0,8)×10 exp ,3
RM=0,2 xm

Impedance calculation : fault at A(HV busbars is to the generation
XA=0,78+0,8~1,58 ohm
RA=0,15+0,72~,0,80,
ZA=√RA.RA+XA XA~1,89 ohm
IA =20×10 exp 3 ÷√3×1,80~6,415
Peak asymmetrical ipA, RA÷XA=0,55,,K=1,2
IPA=1,2×√2×6,415=10,887A.

Fault at B LV base (1,2,3)+(4,5,6)×R,,97 motor .
(410÷20,000) Exp 2=9,42.10.exp -3
XB=[(XA.0.42)+4,2+0,15+15]×10exp -3
XB=6,51 m.ohm and RB=[(RA.0,42)+(0.84+0,57]× 10.exp -3
RB=1,77 m.ohm
- fault D motor (1,2,3)+(4,5,6)+(7,8)+
XD=(XC+015+2,7)×10 exp -3=21,52m
RD=(RC+19,2)×10 exp -3=28.2 m.ohm
RD=(RC+19.2)×10 exp -3 =
ZD=√+RD.Rd)+(Xd.xd) =35,5m ohm
I'd=410÷√3×35,5× 10 .exp -3 ~ 6,700A
RD÷XD=1,31 ,, K~ 1,04
104×√2×6,700~9,9000A
XM=(605+2,7)×10.exp-3~ 140 ohm ,ZM = 624 m .
IM=410÷√3×624 ×10 exp -3 ~,379A
20 motor ,IMC =7,589 A

-ZB=√(RB.RB)+(XB.X.B=6.75m ohm
IB=410/√3×6.75×10 .exp-3=35,070A.
RB/XB=0,27
XC=(XB+0,15+12)×10 exp -3=34,7mohm
RMD=(140/19+19,3)×10 exp -3~26,m
ZMD=43.8m.ohm
IMD=√410/√3×438×10.exp 3=5400A.
6,700+5,400=12,100A en and iPad ~ ,18,450A.

Symmetrical, method 3phase network is unbalanced, magnetic cyclical impedance
no longer , voltage
-positive sequence , negative sequence.
I3,I2,I1 ,we vector geometric construction. Labell

-Fault estimated,
7,440×410/20×10 exp 3=152,5A
Rough calculation.D
Sum x = 4,2+1,5+12=17,7 mohm ,=xD
Sum .R=7,2+19,3=26,5m ohm .

Z'D=√(R'D.RD)+(x'd.xd)
The peak iPad
√2×7,430~10,500A.

Peak asymmetrical 4.8 time their rated current of 98A:
10,500+(4.8×98×√2×20)=23,800A.
-G=e. exp j.2π/3=1/2+j.√3/2.betwen ,I1,I2,I4,..
I2=a.a.I1+aI1+I1
I1=I1+a.I1(2)+I1(0)
I2=a.a.I1.(1)+a.I1(2)+(I1)
.. calculation IEC , 60909>550kv.,
UN./√3fault

Type.of short circuit|

General situation
||fault occure
-3phase .I|||ik3=x.un/√3.|z1)
Zk°√Rk.k+xk.xk. |. I''k3=C.un/√3|z1.
-Ze.=©©|Ik"=c.un/|Z1+Z2|| Ik"=c.un√3. 2|Z1|

Phase to earth Zsc phase o |Ikez=CUn√3|Z1|÷z1.z2+z2.zo+z1.z2.
- Ik2el2=Cub|Zo-aZ(1)÷Z1.Z2+Z2.Ze+Z1.Zo.
Ik2EL2=C in |zo÷z1|-a ÷Z(1)+2Zo
-_____
UnQ=20kv
IkQ=10kA.
T(St.
Cable In.,4m, in =400v,
Sr=400KVA
Ur THv=20kv.
Urkv=4%
Pkrt=4,6kw,
R(o)T/Et=
Problem network supplies transformation, Ik" peak short circuit,I=4m ,
3×185mm,sqr Al
ZL=(0,208+Jo,o68) ohm .km
R(o)L=4.23, X(o)L=1,2.

Solutions fault at F1, impedance of supply network (LV.)
ZQt=CQ.UnQ÷√3.I".kQ×(ur.TLC÷urtHv)exp 2=1.1×20÷√3×10×(0,41÷20)exp 2= 0,534.

Problem power station unity
Stag=250 MVA,,,UrG=21kv ,RG=0,0025 ohm
X"d=17%, XD sat =200%, cos alpha , ,art ,= 250MVA,,
UrTHV÷Ukr=240Kv÷21kv,= ukr =15%,

Impedance generator ,
X"d=x"d÷100×U.U.r.G÷srG=17÷100×21×21÷250=0,2999ohm
ZG=RG+jx'd=0,0025+j0,2999
|ZG|=0,2999 ohm
Srg> 100MVA, RGf =0,005x"d,ZGf=0,0015+j0,2999
KS=UnQ.UnQ÷UrG.UrG ×Ur.Ur×tLv÷ur×thv×Cmax÷2+|x"d-xt|sin alpha
ZS=ks×(t.r×tr.ZG+Zthv)=
0,913(240÷21)exp 2×(0,0025+j0,2999+(0,479+j34,555)
ZS=0,75+j67,313
Zsf=2,226+j67,313
I'm"s=CUnQ÷√3Zs=1,1×220÷√3(0,73+j67,313=0,023-j2,07s,
|Is|=2,08KA
Solutions.
Tree phase fault at F1.
-impedan e of transformer
ZTHV=Ukr÷100×urTHV÷srt=15÷100×240×240÷250=34,56
RTHV=PkrT×Ur.Ur×thv÷srt=15÷100×240×240÷250=0,479
XThv=√z.zthv-rthv.rthv=34,557 ohm.
ZThv=(0,479+j34,557)

-3.section 4 .
Purpose :
Power explain hand book
-basic network analysis /and advance field college. University explanation career
-instrumentation ,
-DC motor and generator ,
-transformers ,
-three -phase induction motor.
-single phase motors
-synchronouse machine.
-generation of electric power.
-Ovehead transmission lines on under ground cables .

-stationery batteries.
-electric energy economic method ,
-ligthing design.

Label drawing resistor groups

- explanation : serie -parallele DC circuit to be analysed:.
Combine all Serie Req=R1+R2+R3+...+En
DE=RB+R14=200+40=240 ohm ,Req, GG=
R7+R8=200+400=600 .ohm , Req ,=, R10+R11==400R.=//.
Req=R1//R2=R1.R2/R1+R2)
G.G=R5//R6=(1009×1500)/1000+500)=600 ohm.
Sum VD, E=VAB+VBC+VDE+VEF
460=60+100+50+120+130v
-computw the current ,V1=VAB+I1.R1, VBC =V2=V3,
VCF=E-(VAB+VBc)=460-(60+100)=30
IA=IT[RB/(RA+RB),
IB=IT[RA/RA+RB, ..
I5+I6=0,5/2=0,55=I5=0,25×(1500/2500)
____---
Explain draw Motor source
-Id = Q c |VC|=1220 VAR (120v)=12
(0+j10,2).@ motor)=cos exp -1)×0,7=45.6
IM= 114.29 /_45.6 °=(10-j.10,2)
IT=IM+IC=(10-j10.2)+(0+j10,2)=10/_0°
100 percent factor capacitor installed in switched bank to provide a range of of correction
(S=P/cos)Teta=1200/0,7=1714.
S/|E|=(1714VA)(120V)=1429.
|.I| ×cos @=(1429A)(0,7)=10A.
QL=|E|I|.√1-cos.xos /_, reactive power factor ,
QL=(120)×(14,29).√1-(0,7)×(0,7)=1714×√o,51=1224 VAR
-Xc=VC.vc/Qc=(120)×(120/1224=11,76
C=1/wxc=1/(377)+1176=225,5

Purpose Explanation :Analysis of offset wave
Calculation average V avg= Vdx=T
T= period ,V avg =Vdx=[(12×1)-(8×1)]=2v
Vrm,v = √area[VT.t]/T=√(12×1) exo+(8×1) exp 2÷2=√104=10.2

-superposition theorem effect 20vdc, VC reached it final ,(steady-state) value
I=9,VR=I×R=0V,VC=20v ,effect of AC voltage (10.sin 377t) circuit ,XC =1/CW

=1/(377)(660×10 exp 6)=4 ohm ,Z=3-j4=5/_-53°
I=E÷Z=(0,707)(10)/_0°/5, /_-53°=1,414/_+53A
I'm=1,414/0,707=2A,
I=0+2sub(377+53°)
VR=I/R=(1,414/_53°)(3/_0°)=4,242/_53°
VR=0+6sin(377+53°)
VC=5.656/0,707=8. /_-37°, VC=5,656/0,07=8v
VC=20+8 sin (377t-37°)
V=√vdc .vdc +(vm1.vm1+....VM.vm)÷2
VM=|T|=√0.0+2.2=1441, |car|=√0.0+6.6/2=2,24
P=I.I×R=(1.414) exp 2×(3)=6v

-Explanation :
VR, 20 v , 10 sin 377t, c=660
W=2.π .f=(2)(3,1416)(60)=377.rad/s,,xL=1/(376)+26,5)×10 exp - 6
Z=R+j(xL-xc)=R+jxEQ,, XEq=xL-xc
Z=√R.R+XEq /_ tan exp -1(XEq/R=|z|/-0,,Z=100+j(188,5-109)=
√(100)(100)+(85,5(85,5)/100=133,5/_41,5°
-E= VR+jvl-jv =VR+JVC,,vx=vl-vc

Label drawing

-Explanation series parallel,RLC Serie parall Serie El,and RC ,,Z1,Z2
-I1=E/Zeq=100/_0° ÷1290/_224°=0,0775/_-22,°
Current rule I2=I1.Z3(Z2+Z3)=(0,0775/_-22,4°)
(100/$-36,9°)÷[500+j1200)+(800-j600)]=0,051/_-841°A,I3=I1Z2(Z2+Z3)=
(0,00775/_-22,4°)(1300÷67,4°)÷(500+j1200)(800-j600)]=0,0709/_202°

-Explanation.source =E=100v/_0°, load 1 ,P=200w,Qc=500v,, parallel load
2,pp=500w,QL=1200v,,
Triangle
Qxc=QL-QC=1200-500=700
S=√PT.PT+Qx.Qx=√700×700+700×700=
989,8

- explained maximum power transfer in AC circuit
Label series , source E 9v/_0°< pallele Z1=10/_53°,Z2=8/$90°,ZL
Statement of the maximum power apply thevenin circuit
ZThv=Z1.Z2(Z1+Z2)=(10/_-53°)(8/_90°÷(8/_90°)÷[6-j8)(j8)=13,3/_-37°ohn
ZThv=10,6+j8 ohm
R=10,6 ohm, xl=8 ohm ,ZL , 133/_-37°=10,6 ohm ,j8 ohm ,RL=106 ohm , ,XC=-8 ohm
ETH=EZ2(Z1+Z2)=(90/_0°)(8/_90°÷[(6-j8)+j8]=12/_90°v
Pmax=|ETh.ETh|÷4RL

Pmax =(12)(12)π(4)(10,6)=3,4w

Explain of a balanced wyE ,wyE system
VAn=120/$0°,V, Vbn=120/_-120°
Vcn=120/120°,ZA==zb=zc=12/$0°
IA=Van/ZA=120/0°,÷/_0°=10/_0°
IB=vbn÷zb=120/_-120°÷12/0°
IN=10/_0°+10/-120°+10/120°=0A
-analyse system balance ,
VAC =200/_0°, VBa,,200/_120°, VBc = 200/_120°, Zac=ZBA=zCB=4/_0°

Drawing diagram start start load source ..
Load current.
IAC= Vac÷zac=200/_0°4/_0°=50/_0°A
IBA=VBA/zBA=200/_120°/4/_0°
50/_120°A÷4/_0°=59/_-120°A
-solve line current
50/_120°=25+j43,3, Icb=50/_-120°
=25-j43,3)loS ,IA=Iac-I a
=(50+Jo)-(25+j43,3)=86,6/_43,3)-(-25-j43,3)=86,6/_-30°,A,IB=IB
IC=(-25+j43,3)-(-25-j433)=86,6/_-90°
-Ic=Icb-Iac=(-25-j43,3)-(50+Jo)=86,6/$-150° ..
_____
3..Drawing label balance, delta,

_____
3.1Explanation: instrument correct transformer line.

3.2 Explain : instrument connect transformer line
A,b,c to 3 p AC ,, RF=10k,R1=20k, Ref=10k,

. drawing labell

2×11×60=1320 ,u. Sec

RC=1/2×P1×RaC
11×60=660hz
C=2,411×E-8farad,
--_____
I=P(V×pf)=20,000/240×80)=104A,
1000,000/2400=41A,
50:5A rating,
Select potential ,2400V, step down ,120V, 20:1,connected 2400,
---
Drawing

Select current : 1500,00/1,73×1200)=72
-line -to-line ,12000V, 12000/120=100:1
_____
Vare enter selected varent ,
I line =300000(1,73×8300)=208A,,
25:5_-A
8300/1,73=4790,
4799/120=39,9A
-scale meter :
Teta ,cos exp-1,,0,8=36.9°
Reactive power=300.00×sin36,9°=300,000×0,6=180,000var

3.3 Explanation Metering internal wiring
-
Connecting a tree phase watthour ,meter with a demand register to power line ,
Drawing.
_____
Union College engineering emeritus

34Explanation DC motor and generator :
a=4, four pole ,lap wound machine constant k=N.p/aπ, N = 780/2 ,=39,
P=4 ,poles ,a=4, (390)(4)/(4π)=124,14,,k=124,14
-calculate the induced voltage function.
EA=, =k×flux×w×m×s,
Finding , 2/0,0397=35,2 rad / v.s
Calibration > EA/w.m=k.flux ,
(124,14)(0,32×10- exp 3 wb)=0,0397

3.4.1.explanation :calculate the speed calibration of the the voltmeter: EA/wm ,,
I/0,0397=25,2 rad / ,IV ,speed of 25,2 rad /s ,2 π rad , calibration , 25,2/2π,,um /s ,I-
V ,,,(r/s)(60/SM)
240 tr/Min

Draw labell
Field load
Terminal voltage ,V t=Ra-ILRa=260,8-(40A)(0,4) ohm=2449

-armature induced voltage
EA = 280v , at 1100r/Min ,
ea =(280)(950/1100)=242V
VT=EA=Is(Ra+Rs)=242V-(630)(0,02+0,0045 ohm =224,7
- explain moment inertia j
T= k2wo, k2=T/wo
{(2.40nm)/(183rad/s)=0,013
Tacc=j/DW/DT, k2Wo=jdw/St.
Integral x1=84 ,X2=0 dr= (j/k2). Integral , x 1=42 , X2=183 (I/w) dw
[t] ,84 to 0 = (j / 0,0013) (ln w) | 42, to 182
-j=(84)(0,013)/(ln42-ln183)=0,742 kg
-explanation calculation the time form dynamic breaking electromagnetic
torque=K1.Ia,
IA=EA/(Ra+Rbr).k2w+k1.k1 ×w/5.29
Or,St=(5,29jdw)/(5,29k2w+k1.k2)
t=4,355

Drawing label

-three phase scr drive for DC , scr calculation average values, equation ,Vag=
(3×√3/2π)×V×cos s
V=(440/√3)√2=359,3V
S=40°,s Bag=0,827×cos,s=(0,827)(359.3)cos alph90°=227,6
S=45°, bag =(0,827)(359,3)(cos45°)=210,1
-conversion = 1100r/Min (πrd).m
60s=115,2
Const torque ,
- explanat ion
Calculate torque ,T=K×Ia,
(10hp)(746w/HP)/1208=35,9A
T=(33,00/0,738Lb,ft=64 7 n
K=I/Is=64,7N, m/35,9A)= ,1,8n.m/A
-ea=kwm, EA =(1,8V are)(115,2rad)
=208v,,EA=VT=Ia.Ra
IA=(2276,6-208)/0,42=46,
.T=k.Ia, 40°, T=(1,8Nm/A)(46,7a)
84,1Nm.,, 45° Fring an ,T=(1.8Nm/A)(5.0A)=9.N.m

Analysis of a transformer connected to loan.

3.5-explanation calculation moment inertia ,
T=
Armature=, poles
(0,75)×(12,4Ia)=9,3 armature field current IL=(0,048)(41,7A)=2,0A
R shunt field , RF = V1/If=240/2.0A=120
IA=IL+If=41,7A+2.0A=43,7A
IA.Ra=(0,0061)/(240v)=14,64V, Is =43,7
RA=14,64v/437A=0,335
_____
Full load IL motor ,IL = 5000w/240V=208
EA=Vf-Ra Is=240-(1.100ohm)(1.8A)=238V.
-pro(loss)=EA.ia=(238)(1,8)=428,42
IL+If,, VT=240,,V=ea-Ra(IL+If)
-starting
IA=IL-If=20A-5,2A=14,8A
Induced ,EA=V.t-Ia(Ra+Rat)=240
-(14,8A)(0,330 ohm+6,57 ohm)=137,9 V,
-test stat restricted
RST=(vt-ea)/Ia-Ra=
(240v-137,9v)/34.8A-0,330ohm=2,60 ohm
-ea= VT -Ia(Ra+RST)=240v-(14,8A)<0,330), 2,60=196,6
Rst2=(vt-ea)/Ia-Ra=240V-(14,8A)(0,330+0,917)=221,5
R1=Rst2=09,97.;; R2=Rst-rst2=260-0,917
=16,83 ohm ,, R3=Rst-Rsti
=6,57 ohm - 2,60 = 3.9
_explain , dynamic breaking for separe excited motor
T=33,00/P/2πn..
P= rating , n= speed ,T=(33,000).(7,5hp)
(2π×1750 tr/Min)= 22.Lb
1N.m /0,738Lb.ft=30,5 N.m
_____
Ia-Ia×.Ia .×Ra....Vt-2v
Calculation rotational losses rate speed ,.calculate initial break
2×3,5 N.m-2,40N, m=58,6
Torq=K1.Ia,,K 1=, I a = 240 m/.1,85=1,3

...

3.6Explain:calculate a procedure,.
-computw the number of primary and secondary turn ,
-N1=V1/V turn =2500/2,5V turn , =1000turn , similarly,n=v2,250/2,5 , turn ,
a=N1/N2=, 1000/100=,10:1
I1=(VA)/V1=25000VA/25000,V=10A,,I2=(VA)/V3,=25,00Va. /250
=100A,, I/a=I'm/I3,=10A/100A=1:10

Drawing labell: I1,,I2 ,zth =5k , Z1,, N 2,, ZL=8ohm,,
Thevenin , impedance.
Z1..5000ohm,, thevenin ZL
8.ohm ,a= √Z1/ZL=√5000 ÷8=25
,,25:1.
-a2= V1/V2=2000÷1000=2÷1, a 3 =V1÷V3,
2000÷500 V =4÷1.
-primairy ,I1,,, I2=V2/Z2..
I3=V3/Z3,,, I 2= 1000V÷500=20A,,, I 3= 5000V/50=10A.

-labell transfo , primary :V=20000,Z1,N1,, N2, N3, v2 = 1000, load Z 2=, 50 ohm ,,Z
3= 50 ohm

N1.I1=N2.I2+N3.I3,,solv.
I1=(N2/N1)I2+(N3/N1)I2,
N2/N1=1/a2,, N3/N1=I/a3.
I1=U2.Ia2+I3.Ia3=(20A(1/2)+(10A)(1/4)=12,5A
-
KVA = V1.I/1000=(2000V)(12,5A)/1000
=25kva , KVA ,= V2.I2/1000
=(1000V)(20A)/1000=20KVA,
KVA3=V3.I3/100=(500V)(10A)
.apparent ,25KVA =(20+5),KVA
-impedan e wind
Z1=a2.a2Z3||a3.a3.a3Z3, Z 2=(2)(2)(50)||
(4.4)(50 ohm)=200||800=160 ohm
Z1 found in step
Z1= V1/I1=2000V/12,5=160

-power requirements:
P1=P2+P3+.... Secondly ,
P1=5+2+10-3=20w
P1=V1.V1÷Z1,,
V1=√P1×Z1=√20×2000.=200v
V2=√5×6=5,48, V3=√2×2×8=4V
V4=√10×16=12,7v, V5=√3×500=38,7ohm
a=V1/V2=200/5.48=36,51
a3=V1/V3=200/4=50:1, a = V1..

3.4 Explain, circuit , Z 1= V1 200 , circuit ,Z2=6 ohm ,p= 5 w,Z2= 8 ohm ,z 4 =, 10,Z5= 500,,
-I 1 ,v 1= 4800v,S1=100,f=60hz,
-I 2 ,n 2 , 609 v load ,S2=,50kva
N3,480v, load ,S3=50kva

a2=V1/v2=N1/n2=4800/600=8:1
N2=N1/a2=800/8=100tirb
a3=V1/V3=N1/N3=4800/480=10:1
N3=N1/a3=800/10=80 turn
I1=(VA)1,/V=1000000/4800=20,83
I2=(Va)/v2=80000/500=83,8
I3=(vA)/V3=50000/480=104,2

Performance and analysis of transformer with a logging
Diagram phasor
R1=0,3 ohm ,x1=15, I 2,N1, X2=0,015
I1, RC,XM , v2,E2, load
-E1,I flux ,lag ,E 1,90°,power factor,R1/a.a,,x1/a a, Req=R1/a.a+R2.
Xeq2=x1/a.a+X2..
Zeq=Req+(jxEQ. jxeq)
a=V1/v2= 2400/240=10:1
Xeq2=(R1.|a.a+R2)+j(x1|a.a+X2)
=(0,3/100-0,003)+J(1,5/100+0,00)=0,03059/_78.69°>
|I2|=(vA)/V2=100.00/240=416,67
I2=416,67/_-36,87°
V1/a=V2+I2.Zeq2=
(416,67/_-36,87°)(0,03059/_78,69=249,69/_1,952°
|V1|=a|V1|a|=10×249.65=2496,5

3.7-explanation loss calculation.

10kva , transformer, 40w iron low ,160-w copper loss at full load efficient 5kva,80%
Pcu,=I1.I1.R1+I2.I2.R2.
Eff= pour/pin = pour/(pour+losses
=Pour/(pour+pin+pcu
=(Va load)(Of)[Va load)
Of+of+pxu ,(Va load) n rating
Efficient=5000×o,8)(500×0,8+40+16)
(5000/10000 ,exp 2)=0,98
-level max efficient
Pcu (KVA/ kV rating,
Efficiency= p out (pour+pi+pcu) = 5000(5000+40+40)94
All day efficient , 24h trans.
Loss is a total ,P.t
(180×24)/1000=4,32kw,
W cubtotal ,(1×1×620×8+0,5×0,5×620×5+0,25×0,25×620×7)/1000=6,006kw,,20h
-wloss=50×8+50×1/2.5+50×@/4×7=612,5kw.
----------_--------
Explain draw
Generator ,I1p connection l1
and l2 ,13kv, primary, secondary 138kv , ,load rated =50Mww,,delta start ,x1,n1

a=N1/N2=13.000/79,677=0,163,.I1s=a.I1.p√3=(0,163÷2221/√3=209...
Load { total KVA /√3=80kva/√3=46,2Kv
-46,2kva/40kva×100%=115,5%
=√3×40=69,3
=69,9kva/120kva,x100=57,7
----------+
Delta Delta connection,80 kV /√3=26,67kva,load ,=KVA,
= 46,2kva/26,67kva×100=173,2%

----------_
3.6 Explain phase induction motor ,
I1,r,1x 1, RC,XM ,E 1, v,1, i2,X2, E2,R2/s.
equivenlent diagram
Solutions.
1.fulk load shaft power = 15×746=,11,190 w mechanical power development
(pm)=,shaft power friction ,I1,R1,X1, RC ,XM, I'2-I2/a,x'2=a.a,X2,R',R'2/s(1-s),
R'2/s=a.aR2/s
Pm=11,190+820=12,010w.
2synchrouna speed (Na)=f/p,
Ns=60/2=30×60=1800 r/Min
Slip(s)=(ns-n)/Na
S=(1809-1710)÷1800=0,05

Air gap power (page)=Pm÷(1-s)
Pafg=12,010/(1-0,05)=12,642.
-rotor copper loss (pcu.pcu)=SPG
Pcu 2=0,05×12642,1=632,1
-no load test f=60hz,V=229,9,v =6,36A,P=5/2w,
-locked rotor test F1=15hz,v=24,I=24,06,P=721w,
-locked rotor test at f1=60hz,
I=110A,P=27,225w
Aveg,wind resis stator terminal=0,42ogm
No load test
|Znl|=VNl÷√3.INL=229,9/(1,73×6,36)=20,87 ohm
Rnl=Pnl/3nl=512/(3×6,35 exp 2)=4,22 ohm
Znl=√|znl| exp 2-Rc .exp #=√2a,86. Exp #-4.22 exp 2=20,44 ohm
Lock rotor test ,
Zin=V÷√3.I=24÷(1.732×24.06)=0,576 ohm
-R1+R'2=P÷3.I.I=721÷(3×24.06.exp 2)=0,415 ohm
X1=X'2=√zin.exp 2-(R1+R'2)exp 2
=√0,576 exp 2-0,415 .exp 2=0,404 ohm
To determine leakage ,60hz,
XL=(60÷15)(x'1+x'2)=60/15×o,403=1,616ohm
X1=0.3xl=0.3x1.616=0.485 ohm
X2=0.7xL=0.7xL=0.7×1.616=1.319ohm
. magnetic react
XM=Xnl-x1=20.44-0,485=19,955 ohm ,
PG=pnl-3.i.R1=27,225-3×110 exp × o,21= ,=19,602 w

3.7 Explanation:
-3÷188,5×(241,2)(241,2)×0,2÷1=185,2Nm
-R2'/S=0,2/0,0333=6,01ohm,
Z1=(0,25+j0,15)+(j30)(6,01+j0,5/6,01+j30,5)=0,25+j0,5+5,597+j1,596=6,2123/_19,7°
-Ifl=265,6/6,2123/_19,7=42,754/_-19,7°A
It's/IfL=245,9÷42,754=5,75, of =cos (19,7°)=0,94 log
-T=3÷188,5×+(261,3)(261,3)÷(0,49+0,5).exp ×6,01=163 , NM

Pag=Two.sin =163,11×188,5=30,746,2
-Rotor copper loss:
P2=sPag=0,033×30,746,2=1033,9w
P mech =(1-0,0333(×30.746,2=28,7223
Pour=Pmec-p rot=29,7223-1700=28,0223
Pin=3×.V1.×I1×cos flux.
=3×265,6×42,754×0,94=32,0024
Eff rotor = 28,0223÷32.022,4×100=87,5%
-effinte =(1-s)=1-0,033=0,967=96,7%
STmax=0,2/((0,24)(0,24)+(0,49+0,5)exp2)exp 1/2=0,1963
Tmax=3÷2×188,5.[(261,3)exp 2÷0,24+(0,24)(0,24)+(0,49+0,5)exp .2)exp
1/2=431,68N.m
-Tmax ÷TpL=431,68/163,11=2,65.

STmax=1-(R2/(Xm+X2)=1-(0,58÷(2,6+0,271)=0,98
Breaking

Labels
Drawing

WS=2πf/P=(2π×60)÷2=188,5 rad/s
TL=Pg÷ws=19,602÷188,5=104N.m
Resistance reactance.
R'2=(R1+R'2)-R1=0,415-0,204 .ohm
R=P÷3×I×I=27,225÷(3×110×110)=0,75 ohm
X=√z.z-R.R=√1.207×1.207-0,75×075=0,95 .ohm
X'2=X-X1=0,95-0,485=0,465 ohm
-Rotor at start
RfL=R-R1=0,75-0,21=0,54 ohm

-IEEE..test for empire
Reactance rotation|sQuire cage design|w
X1/XL : a 0,5: B;0,4;c 0,3;D 0,5
X2/XL
_____
-Performan e characteristics
Tech=1/w×3.V1.V1/✓R1+(R'2÷S)]exp 2+(X1+X'2)=R'2÷S
-AT low value of slip
Timex ~ I/was 3V1.v1/R'2×s
At .value of slip .
Timex ~I/Was.3×V1×V1/(X1+X2)exp 2=R'2/S
- Tmax = 1/2ws×3×v1v1/R1+√R1.R1+(X1+X'2)
-stator core rotor friction and wind ,

Loss ,Pag ,pin Elec ,pmec ,windage loss ,P out mec,stator resi loss (3.I1.I1.R1)
-3phase
I.a.V1=460×√3=265,6 V ,start ,S=1,the input impedance,
Z1=0,2+ -j30(0,2+j0,5)/0,2+-j30,5=1.08/_66°
The starting current
It's=265,6÷1,08/_66°=245,9/_-66°A.
Wayne=1800÷60×2π=188,5rad/s
Vth=265,6×(-j30,0)÷0,25+j30,5~261,3V
ZThv=-j30(0,25+j0,5/0,25+j30=0,55/_63,9°
=0,24j+j0,49
Rath=0,24ohn ,XTh=0,49 ~x .
It's=Pag÷wsyn=I2.×2R'2/S÷w.a
=3÷188,5×(261,3) exp 2÷(0,24+0,2)exp 2(0,49+0,5)× 0,2÷1=

3.9-explanation: .
1.select base value:
VA base =150MVA, vbase =13,8kv,,fbase = 60hz,value base,
2.calculate RMS stator phase current base ,Is base , Is (base) = (MVA base
×1009)(√3×Kv base)=(150)(1000)/√3(13,8=6276A,
3.)calculate peak stator phase current base ,U base , I (base) =
√2×Is(base)=√2)×(6276)=8875A.
-4) calculat statore base impedance Z, ,base ,ZS (base)=KV..base / MVA base
=13.8)exp 2/150=1,270 ohm
5) calculate base inductance ,La (base ,
La (base) =ZS=(base)/Abase=1270/377=3,37×10 exp -3
6)calculate field base impedance Zfd(base)
Zfd ,base = (Lad/LAFD ,base =(0,0056÷0,0138)×8876=3602A.
7)calculate field base impedance Zfd (base)
Zfd(base)=MVa base ×10 .exp 6÷id(base ,=150×10 .exp 6 =11,56
8)calculate field base inductance Lfd (base)
Lfd(base) = Zfd (base /w base = 11,56/377=30,66×10.exp-3 H
9) calculate field base voltage ,EF d base
10).calculate direct axes armortiaeur base current current is ks (base) lad / laks is
base ,
=(0,0056/0,0054)+8876)=9204

11)calculate direct axis armortiaseur base inductance.
lkd(base)=Zkd(base)/wbase=1,77/377=4,70×10 exp -3 H
I Zk , direct axis armortiaseur base current
-12,). 1kd (base)(load/laks)(base)=(0,0056/0,0053)(8875)=9204A.
13) calculate quadrature - axis armortiaseur base inductance ,L,kq (base)
Lkq(base)=Zkq(base)/wb=1,77÷377=4,70×10. Exp -3
-350×10 exp 3 W-(399,8hp)(746w/HP)-44,186w=7563
-calculatiin of efficiency because
=+399,8hp)(746w/HP)(100%)/[399,8hp)(746whp)+44,186wt, 7563w]=85,2%
-calculate counter ,EMF
(Tuvr)-(resist volt drop) -(reactive voltage ,240 /_0°
(1580/_-38.1°A)(0,0177 ohm)-j(1580/_-38/A)(0,046 ohm)
=240-22.0+j17,3-44,9-449-449-j57,2=173,1j-j39,9=177,7/_13°

-14 calculate quadrature axis armortiaseur base impedance L.kq(base)
Lkq (base) = Zk(base)/wbase =2246/377=5,96×10 exp -3
16.calxulate base mutual inductance between armortiaseur and field Lfd base ,lfk
base = (ifs(base) / ikd (base) Lfd (base)=
(3602/9203)+30,66×10 exp -3)=12×10 exp -3H
17. Calculate base flux linkage flux ,base .
Flux (base) = La (base) is (base) = (3,37×10 exp - 3) ×8875=29,9wb

-calculate base rotation speed in r/term ,
Base speed is 120 f base ,IP = (120)+60/2)=3600r/Min
-calculate base torque ,t base ,
T base = (7,04 MVA base × 10) minimum base ,
= (7,04)(150)(10 exp 6) ÷ 3600=293 ,kLb ,ft (3972 kn.m)

_____

Calculate per - unit base Quantitie for a 150-Mva ,13,7kv,60 Hz ,3 ph two pole synchronisation machine following constant axis mutual inductance between, Inductance between stator winding a and rotor ,L AFA = 0,0054H ,Q axis mutual inductance between rotor stator winding a and q axis armortiaseur,Lakq= 0,0963 H ,the per unit system and denote rotor
-calculate procedure:
1. Determine the speed at breakdown torque synchronous in speed is calculated from the equation n,sync= 129 f/p , r/Min where ,f frequently,in Hz and ,P= number of poles this) synchronisation=120(60)(1800)×4 ,at the point where the torque in percent breakdown torque is 109,the speed in percent of synchronisation torque is 100,the speed %, of synchronisation speed is thus the rotor ,speed is not= 0,80 synch=0,80)×(1800)=14400trm
-calculate the hors power at breakdown
The general equation)+HP Min) /33,000f.t,lb=(torque in lb, ,n rot in r/Min)/52521 ; 16°z,,Lb , 13 in = ift

-ho = (torque in o in) (n rot ,r/Min)÷1,008,403,2
HP=(torque in o .in)(n rot in r/ Min)×10 .exp -6 break down,
HP = (10,50z in) (1440r/ Min) ÷10 exp 6=15,12÷10 exp -3, how = 1512 ..
- repulsion motor , 24 slot the armature ,
Slot ° (24)+2)=48 coil
ZR=(3,5×10 exo -3 WB)(576 conductor)(3600r/Min)(2poles)/√2)+60hz,
(2pharh)=85,5

-calculate the AC impedance of the rotor circuit.
-inductuve is calculated XL=WL=2πfL.
Frequency,L=inductance,XL=(2π)×(60)×(36×10.exp-3H)=13,5ohm
Impedance of the rotor circuit is R+jxl=2,7+j13,6 ohm =13,9/_78.8°

-IK,R,JXL,VL,,
Flux magnetic properties
T=K.flux.il..kflux ,
T state /IL=2,3N
m/3,6A=0,639wb
IL=VL/Z=120V ÷ 13,9=8,63A
-3.Calcul the AC starting torque
T=k.flux.IL, T start , ..k.flux.il=(1,53wb)(8,63a)=132.
4) calcul counter efn
EA=VL-IL.Z..IL..to , 85% first càlcul
-j48.1=|20.7/_-240V, repeat IL,24°, EA = 120°/_0°-(3,6/_-24°)+13,9/$78,8°)=120-
50,04/$54,8°=120-28,8-j40,9
=91,2-j40,2=99,95/$-24,2, -24° remain
Pmec=EA.iL=(99,95)(3,6A)=359,8w
-VL lag VL, of ° cos 24,2°=0,912 from information ,
Pmech = VL×IL×cos-coppwr loss = VL×IL×cos-IL×IL×R=
(120v)(36A)(0,912)-(3,6A)(3,6)(2,7)=383,97-3499=359
359.8w. VL=120/_0°.
_____&&
Drawing label
Phasor diagram motor universal :
ea°99,95/_-242°V,
|IL.R|=972V.
IL°3.6/_-24,2°
--------_____
Repulsion motor drawing diagram

3.9.Explanation,
-J√3.V.V/XD.
roduis ,is RF=√3.√Emax /XD=
√3(10)×(1,85)÷1,78=1,8p.u
V=I.××o×p×u,
Local , o (-10×√3)÷1,78=0,-j 9,96
-3 calculate steady state.
Jv2÷2(1xe-1÷XD)=J/2(I÷0,4-1×1,78)=
J.o.96.
RL=roduis
=V2.V2(1÷Xe×1÷xd)=1÷2(1÷0,4+177)=1,53pu.

- 3.10 explanation: GENERATION REGULATION:
-Ea=0,00219,power factor =0,975 ,zero
-Calculate potier reactance,XP
So=E+√3×Ia×xp , from zero power factor,.Eo= voltage at not load E,I,S. Terminal , voltage in RD= RE+DE,, DE=√3×Ia×xp
XP= Is xp÷(VLL÷√3)=D.E÷VLL=DE÷RE=0,43Pu,
EP=1,175Pu.
-power output and power factor.
Calculate the maximum output ,power for an excitation increase of 20% for a 13,8KV ,eye ,connected generator having a synchronous impedance of 38ohm phase it is connected to an infinite bus and delivery ,3900A ,at unity power factor , -1 drawing phasor diagram, subscription indicate initial conditions , voltage vs ,the line -to-neutral Angle and between the phase voltage and phase current.

2 .calculat voltage behind synchronous reactance
E=(1X,)+1X)-V.V] exo 1/2 = [3900×3,8÷1000) exp 2 -(13,8÷√3)]exp 1/2=14,54 KV
3.calcul maximum power Pnax
Pmax=3.E.V.I.X ,,sin§=1 for maximum
Power ,20% higher excitation.
Pmax = [(3)(1.2)(14,53)(13,8÷√3÷3,8=110MW
-Calculate power factor,
Flux =E.I÷Xs=14,53÷(3,9)(3,8)=0,97

-per unit Quadrature axis reactance calculate the synchronous and substrasient per unit reactance for the quadrature axis of the machine in the first , additional data ,for the machine are ,q-axia armortiaseur ,self inductance L,K,Kq=0,0107H, and the ,q-axia Lak = 6,3×10 exp -3 ,

-calculate ,Law
From value obtained in the two previous,
IQ=Lq/La(base)=0,0058÷(3,37×10 exp -3)=1,72 pu.
-calculate .IQ
L.q=Law+L1=1,72+0,12=1,84
Calculate ,Lkkq and Lakq.
L.k.kq=L.k.q÷Lq(base)=0,0107÷(5,96×10 exo -3)=2,80 Pu ,
IA.kq÷(La.base)+ base) ÷Ikq(base)
=(6,3×10 exp -3)÷(3,37×10.rxp-3)(8876÷8172)=2,72pu

4)
Calcul per unit value of q-q ,axis armortiaseur leakage inductance ,IkQ ,1kq=1k.kq-
ILq=180-1.72=0,08Pu

5).calculate per unit transient inductance.
Lq=Law.Lkq÷(Law+Lkq)+L1=(1,72)+0,08)÷(1,72+0,07)-0,12=0,195 Pu
- calculate if and ikd
The quantity are ,ifd rfs ,Zsd (base)=
0,0072÷11,56=6,23×10 exp-4, and Ikd= rkd÷Zkd base ,= 0,028÷1,77=0,0158pu
-calculate field open circuit time constant,T,ok
T'd=Lffd÷Ifd=1,74÷(6,23×10 exo -4)=2793,Pu
-calculate: substrasient open - circuit time constant,
I" o/o=(I/Iko)(Lkd+lfd.ladπlfdd)=
(1÷0,00157)(0,19+(008)(6,66÷1,741)]=16.9Pu
-Calcul per unit transient and subtransion short circuit time constant for the direct
axis the direct axis armortiseur leakage,time constant ,
-calculate per unit transient short circuit time constant ,Ta
T'd=(I/FD)[Lfd+Li.los÷+Le+Lad)
[1÷6,23×10 exp -4)(0,08+(0,12)(1,66)/(0,012+166)]=308
-Calculate per unit substrasient short circuit time constant ,T" oO
1÷F.kd×[Ln+1÷(1/Lad)+(1/Lfd)+(1/L1)]
=1÷0,00158×0,19+1÷(1÷1,66)+(1÷0,08)+(1÷0,12)

- 3.calcul per unit armortiaseur leakage time constant ,Tkd,
Tkd=Kkd÷Ikd=0,19÷0,158=12.pu
I/w(base)=1÷377, Y=T÷377

-phasor diagram synchronous generator
1.determine
If the Va and V base value are equal to the machine rating ,Is base =
(MVA)×1000)÷√3kv=(100)(1000)÷√3)(13,8)=4184 ,base voltage a ,13,8 kV ,per unit
RMS , terminal voltage ,is Ei=1.0 Pu
Per unit peak voltage

Teta = U.O/$0°.P.u will be chosen ,phasor
2) local ,q- axis ,
EQ=|EQ|/§ machine internal power angle. EQ, ,,Eq° a+ j(r+ jxq), but ju = 1.0/$0°
Pu,where, Teta = cos -1 , 0,8 = -36,9,,,EQ=1/_0°+1.0/_-36°×j1.84=2,38/_35°
Pu power angle ,×=35°
- Calculation a frictional ,EQ=|EQ|/s.
-ea=|a|cos§=(1,0)(0,819)=0,818pu
ed=|a|.sin×=+1.0)(0,573)=0,574 .Pu and
Jq=|j1|.cos(§-teta)=1×0×cos(35°+36,9°)=0,311 ,Pu
JD=|j|.sub(×-0)=0,951.pu

-voltage ,E1, Q axis represents.
E1=Xad,j+d=eq-xd.is+rid=0,819+(1.89)(0,951)=257pu
- explain, Generatie - capabilities curve :
generator , supa ability curves , supplied the manufacture is used to determine the ability of generator to delivery real (Me) and reactive ,(MVar) power to a network determine the capability curve in per unit value of a generator
-characteristic : 989 KVA ,of = 0,85 synchronous reactance ,XD = 1,77 Pu , maximum value of generator internal voltage ,Emax =1,75 p.u terminal voltage ,V= 1.9 Pu ,§= load angle and the system reactance external to generator ,is XE=0,4 .p.u
-calculate stator limited portion stator ,limited is directly proportional ,full power output ,arc ofa circle medium ,Rs=1,9 p.u
- calcul field - limited,P=(3×V.Emax/XD)
Sin§+j(√3.×C.E.max÷Xd.cos§-√3.V.÷XD)

Explanation:-Generation rating for installation:-generation rating in MVA = turbine rating in MW /power factor,generator for 600-MW=rating 600Mw /0,99=677MVA.-
o

3.11 Explanation: calculate generator output ,P
Po= √3×KV×IA×pf=(√3)(25)(28.000)(0,975)=1.182,125kw
-calculate generator officiency
Efficiency=power out put)÷+power output+total losses)
=1.182,125÷(1.182,125+10.910=0,99
-calculate synchronisation coefficient at rated load for the following generator :
75.000kw , terminal voltage ,V=I×o×p×u, armature current,

IA=I×p×u,
Quadrature axes reactance ,X2=1,8 ×pu×
Of=0,80 lagging , neglected the resistive components of armature
- calculated rated load angles §
The angle §=tan .exp -1.[xq×cos$×Ia÷(Ia×xa×sin$+V)]
Tan .exp-1[1.8)(0,80)(1.0)÷[(1.0)(1,89)(0,6)+1]=35°
-calculate synchronising power coefficient,Pr
Or=(rates kW)÷(rates load angle × 2π÷360)=(75)(1000)÷(2π÷360)=122,780 kW/rad.

-Generation efficiency:
Determine the efficiency of generator having the same basic characteristics of the generator in the generator regulation additional data including armature full load current ,IA=28.000A ,core and short circuit losses a friction and
windage ,loss ,500Kw ,from drive rotor input ,armature , resistance ,Ra=0,0011ohm phase excitation voltage a rates ,470C, excitation current for air gap line 3200A,and output voltage ,25 kV ,compute core loss from and the potier voltage So=1.175 ×p.u, loss 21000kw

-determine short circuit loss for 1.0 Pu line current ,short circuit loss =4700kw
-calculate stray current loss ,stray current ,loss =short - circuit ,loss , armature,loss =4700-862=3838Kw
- calcul power for excitation power for excitation=field voltage ×IfL
=(470)(2,4)(3200)÷1000=3610Kw, IFL

-Determine e total losses :
--friction and windage : 500kw
Core loss. : 2,100kw
Armature copper loss. : 862 kW
Stray current loss. : 3,838kw
Power for excitation. : 3,619kw
Total losses : 10,910kw

-Explain: Generator grounding transformer and resistor.
-determine the size of a transformer and resistor required to adequately provide a high resistance ground system for a Wye, delta start connected generated rated 1009MVA ,26KV ,60GZ,in addition generator capacitance= 1,27 ,if man transformer capacitance =0,12 if ,generator lead capacitance= 0,01uf and auxiliary transformer capacitance = 0,024uf

-calculate generator line -to -neutrak voltage ,VL- N=(26kv)÷√3=15kv
-calculate total capacitance ,CT
CT=to+1,27+0,12+0,01+0,024)if=1,424 uf .
- calculate total capacitve reactance ,Xct

XcT= 1÷2πfcT=1÷(6,28)(60)+1,424×10 exp -6)=1864 ohm
-select ,R= XcT to limit transient over voltage during a line _to_ ground fault assume a 19,92÷0,480Kv
Transformer the resistance reflected to the primary ,is .R'=N.N×R, R' is the requirements resistor ,solve ,R=R'B.N ,,, B= 19,92π0,480=41,5
R=1864÷41,5 exp 2=1,08 ohm

-calculate transformer secondary voltage ,Vs during a line - to - ground fault ,vs = Vs = 1500÷41,5=361V.

- calcul current Is , through grounded resistor ,Is° Vs÷R=351÷1,08=334,3A
-calcul required continuous rating ,in KVA grounds transformer rating is KVA ,= I,V, = (334,3)(361)=120,7kva.
- sele

- explain:selected short time rated transformer from ANSI standards ,a50 -kva transformer may be used 9 Min , rating is adequate,

-calculate generator line -to -ground fault current ,If , if = V/XcT =15.000÷1864 =8.05
-Power -factor improvement.
An industrial plant has a 500-hp induction motor load a 4000V, with an average power factor of 0,8 logging ,and a erage motor efficient of 90% ,A new synchronous motor rates at 3000hp is installed to replace on equivenlent load of induction motor the synchronous motor efficient determine the synchronous motor current and power factor for a system current if 80%od the original system and unity power factor
- calculate initial system rating KVA
The rating is KVA=(HP /b)(0,745/of)=(500/0,8)/(0,746/0,8)=518KVA,,n efficiency
- calcul initial system current I o
Io=0,8Ii°(0,7)(746)=597A
-neq induction - motor ,I1
I1=0,746 hob/. √3.n.pf =(0,746)(200)/√3(3)(0,9)(0,8)=299A,

- cal synchronous - motor power factor ,- PFA = 3588/40/1=0,895
-calculate synchronous motor power factor PFA , PFS = 358,8/401,1=0,895
Related calcul verification synchronous rotor
horse ,3000hob,,,ho's=3×V×I×n×pf/0,746=
(√3)(4)(401,1)(0,895)/0,746=3000hp

-

me
- 3.14. explanation: design calculation: autotransformer starting;

Labell drawing:

Alpha= voltage tap = VLA ÷Vs
ILA= alpha / LA = motor ,
ILL=alpha /ILA= aloha K1= Line current for
= Alpha, I1+0,15In for (a) motor torque

-ZL= total input impedance
ZL=motor impedance
Rs=starter resistance
ILR=motor current .

Motor locked rocked rotor resistance
ILR=VLR÷ZL=alpha.VL÷ZL=IL
|Z×IL| I=I×RL+jxl, I=VL÷IR=VL÷alpha×IL
=(Z/alpha) Ohm
-RiL=Rs+RL=√Z exp 2×IL- XL.exp 2
R.S = (RiL-RL)
Of = cos (Teta) = RiL + ZIL

-multi step starrting :
. drawing:

R'2/Smart/

-Rx1=Rmax
-Rx2=S1.R2.Rx4=S1.Rx3
-Rx4=S1.Rx5
rx1=Rx1-Rx2=
Rx.z=rx2-rx3
Rx3=-rx4..

-speed control operating supply,
Tm1÷Tm2=S1÷S2÷4
Tf1÷Tf2=N1. Exp2/n2 .exp 2 =(1-s1) exp 2/ 1- S2) expb
Impedance motor
XL=WL, r+jxl, T= k ,flux,L,, T = k.flux
-Po=√3×Kv×A×pf

-e valuation of annual O ,M cost Vs installed capitals cost

Cost component | unit A. | Unit B.

-Net unit heat rate .|10,55 MJ/kWh| ..-/-
-unit availability. |10.00 but kWh| -/-
-unit rating. | 95%| -/-
-installed capit cost| 600Mn| -/-
- levelized average | 18.00 % | -/-
-for annual fixed
Charge (9450×10 ,exp)(118/100)=18709×10.exp ,6
Annual fixed charge
Annual cost used for compare

91,69×10 ,exp 10 ,exp 6
- cost penalty

-3.14. Explanation :Overhead transmission line and under ground cables :
-calculate flux one conductor

-Inductive impedance
©
©. ©
- transmission line geometry portion
Diagram
.

-effect of mutual flux line.

- charge two conduct .
..Is , RK, K ,IR

Long lines Vs = VR+IRZe),expb+(VR-IR-Ze)e .expb along
Is=+VR/Zc+IR)exp + (VR/ Ze - IR) ,exp ,e - alpha e
Zc= √ Z/y- ,, propagation cost ,,
Alpha = = √ Z.y , per kilometre .

- calculating sending voltage for (200 m transmission line receiving to - line voltage ,is 239 kV ,and the is 200 at power factor ,0,8 logging promote ,R=0,2 ohm , L = 2 MH , C = 0,01 if , f = 60 Hz
Determine YL , and ZL ,
.TL = hw × CL × 1/km .1=jb×77(0,01)(19 exp -6)/km×320km= j.1206 micros sub(micro second)
ZL=RL/km×1+XL/km.×1=0,2 ohm/kn(329km)+377(2)(10 exp -3) ohm / km × 329 km =-6,4+j241,3ohm

-capacitance of two wire line :
E=P×L/2

-Capacitance of two -wire line
E=P×L÷2×π×€×r
Vab=(resistivity ×length÷2×π×€) Ln(b÷a)
E=(resistivity ×Length÷2×π÷€)[1÷r-1÷(D-r)].V/m
r>a ,center
-V1.r=(resistivity ×Kength÷2×π×€)ln[r(D-a)÷a(D-r)].C
-D>a ,V÷2=(resistivity ×Length÷π×€)Ln(D÷a)×V
-C'=q÷V,, Q= resistivity ×length ,,
C=C'/Lor,C ,,π÷Ln(D÷a), f/m

-find capacitance to neutral for conductor transmission line ,if =
D=8ft×(2,4m),a=0,25 in (0,0^{o}625)
Length of line is @0m.(16km), frequency is 377 Rod

-ZC=1÷w×c , substitute for ,X=0,0388 ,log (D÷a) obtain
-XC=1÷(377)(0,0388)(@0)÷log (2,4÷0,00625)]=0,0026 M,

-phase quadrature components
,start motor ,
VL= 120°/_0°, phasorw locked rotor ,Is=8,4/_-145°
A=8,13-j2,10A , similarly

In= 12,64/_-40,0° ,A = 9,69-j8,18
In phase = 8,13+9,69=17,82A
Iquad ,= -j2,10-j8,13=-j10,23A
I star= 17,82-j10,23A=20,55/_29°
Pfact start = cos 29°,86=0,867
T,start = k.Im.sin.a
=(0,18V,s/A)(0,4A)(12,05).sin 25
=8,46V

ZA=Za×bZ×Ca÷Zav-Zbc+Zc
Zb=Zab.Zbc÷Zab+Zbc+Zca
Zc=Zbc.Zco÷Zab+zbc+Zca

Zab=Zab+ZbZc+ZcZ2÷Zc
Zbc=Zazb+Zb.Zc+ZcZc÷za
Zca=Zazb+Zb.zc+Zc.iz÷zb

(Xa.zb+xb.xc+XC.xa)÷xc
zbc=(xa.xb+xb.xc+XC.xa)÷xa
XB.xc+XC.xa)÷xb
Xa=Zab.xca÷xab+xbc+xca
XC=xbcxca÷xab+xbc+xca

Labell
Generator ,12,2 kV, x"=0,19pu,50.000kva

Motor 1: 30000KVA,X"=0,29per ,,4,2kv

Motor 2: 20.000kva,X"=0,25. , 2,2 kV
-tfo :
Primary : 13,2kv,: 50MVA,,,
Secondary: 4,2kv, 30MVA,,
Tertairw :2,2kv,,20Mv

Label ,R'j0,68,,,L2=10,012; ,j0,002, equivalent,0,034
Correct motor reactance ,X" motor ,0,2 base ,30.000kva , 4,2kv,
(0,20)(50,000/30000)(4,2/13,2)Exp 2=0,034Pa,
X" load 2, 20000Kva , 2,2kv
(0,25)(50,000/20.000)(2,2/13,2).exo 2=0,017
Calculation of complex power ,P+jQ
Balanced 3 phase, ..
5.0/_-37°, line voltage ,is
69/_0°,per unit base of ,10000KVa and 72 kV,,

- design drawings ,

.lx. Matrix
|0. 1. 1 |
|1/_60°. 0. J |
|1/_120° -1. J|
_____=0,863/_191,67°
|1. 1. 1|
|-1. 0. J|
|0. -1. J

Explanation-Electric -power network
2generator. // :13,2kv , and ,13,2166, sending bus ,6,6kv ,,Tertia ,transfo motor , 7,5kv , and transfo 66 kV /12 kV , output ,6motor M1,M2,M3,M4,M5,M6, 0f 12 kV parallel ,,

Labell , circuit generator with tree impedance Serie ,j0,101,,j0,03, j0,10 line and transfo two motor Ma,MB ,impedance ,j 0,222,,,h0,333
_____
Explanation
Generator 1=40.000kv, 13,2kv,,X"=0,20
Generator 2=30000kv, X"=0,25 Pu
Transformer=75,000Kv , 13,2kv,, 66,kV, x = Pu

_____
Calculate , impedance :3000kva ,
Jxtotal=(j0,15)(j0,25)÷(j0,15+0,25)+(j0,04=0,134pu

_____
Generator react .
X"=(0,25)(3000/300000)=0,24pu
30.000kva,, X"=(0,25)(75,000)/300000=0,625pu
Transfo reactance ,
X=(0,1)(30,000/75.500)=0,04 ohm py
30.000kva ,base

3.14. -explanation: Phase shift in Wye Delta.H2=B,, IBH2=A,IA,IAn,,,Generator
GA ,line ,motor 0ne,ZB=0,6+j0,77 GB -ZA=15+j1,5 ohm
O=√3.E/ne.IL×cos,P=E×I×cosIA=PA÷EA×c

-explanation:
-Bus iV^,, Is, Vs,, Vy^, bus j ,,I pi,you, IPS ,,
-find slack bus power PG, ,i-j
Yn=Is+Ipr(v1-vy)ys+V1.p1

-Power,
Sn=Pn+jQn=V1.In=V1(V1y-Vj)y+|y1|.y1|.yP1.
Sjn=Pjn+jQj=Vy.Iy=By(V1x-V1)us+|Vy|.yP1.
-Power loads in line (1-j)
Slip=Sij+Syi
-Talor
f(x)=f(a)+(x-a).df÷dx|+(x-a).n÷2!×d.df÷dx|+....+(X-a).expn÷n!×d n exp f ÷dx. Exn +Rn.
df÷dx|a=,
Value derivatives evaluation x =a,
Serie converges if , Lim ,n to inf .Rn=0
Non linear.
-f1(x1,X3,.....xn)=y1
-f2(x1,X2,.....xn)=y2

-fn(x1,X2.....xn)=Yn.
FK(x1,X2,.....xn)=y, k=1,2,3..

|y1_f1(X1,°X2°....Xn°|
|y2_f2(X1°,X2°....Xn°|=
|yn-fn(X1°,X2,.....Xn|

|df1÷dx1|x1°df1÷dx2|x2°...df1÷dxn|Xn°|
|df2÷dx1|x1°df2÷dx1|x2...° df2÷dxn|xn°|
|dfn÷dx1|x1°dfn÷dx2|x(°).dfn÷dn|Xn|=
[ΔX1]
[ΔX2]
[Δxn]

[Δu]°=[j]°[Δx]°
[Δx]=(oji°)exp 1 [Δu]
[X], =[x]°+[Δx]°
[x]•=[x]exp k +[Δx] .k

-newton- raphasor , method applied to power flow

P1=sum ,n ,k=1,|V1||VK||yik|.cos(§k-§1+ aphk)= f1p.
Q1= -sum,n,k=1|V1||VK||y1.k|.sin (k-§1+alph ok)=
I = 2...

-transformers regulation determined from short circuit test ,
-% regulation = [V input - V output) V input) [100%](2300-
2236)÷23000](100%=2,78%
Single phase load current, KVA = V.I÷1000=apparently,
I= 10000kva /v=(1000)(5)/23000=2,17A
Test ,of = of = W÷VA=of=90÷66)(2,17)=0,628
Lagging, cos -1,= 0,628=Teta =51,1°, cos 0,80=Teta,369°

- transfo output voltage for serving ,0,80 of load rated ,VIR = VSS cos (Teta - load)
66,cos (51,1°-36,9°)=66cos,|14,2°=64,0 where Vs = short circuit , impedance phase
angle ,Ix ,,
VIX=Vsc.sin(Teta 11-teta load)=,66sin 14,3°=16,2, V input = (Voutput + ViR),exo
2+(VIX)=2300,exo 2= (Voutput + 64)exp 2+ 16,2 exp 2 = 2236 V ,

-induct of two wire transmission
©<----D---+->© , lM day °(u÷2π)[1/4+lnD/a)WB
Turns / m ,, L= lamb /1.. L=(2×10,exp-7)
[1/4+ln(D/a).H/m, inductance ,L may be expected,

L= (2×10 exo 7) Ln (D/r) r ' = a ,
LR = 2 L = (4 × 10 ,expb-7) ,LT° 1,482×log(S/r')

-
...

[

-3.15.explanation: two wire ; 10mi(16,1km),two transmission wher ,D= 8ft(2,44m),
a=0,1n(2,54mm),at a frequency of 60hz , 377 rods /s ,
- geometric mean raduis GMR ,r'=0,7788)(2,54×10×10 .exo -3)=0,0019780,
Calculate LT=(4×10 .exob-7) ln(D/r)=(4×10 .exp -6) ln
(2,44/10.001978)=28,5×10,exp
-reactance XL=(377)(28,5×10 exp -7)ln(2,44/0,001978(=28,5×10 ,exp-
7hm)(16,1×10ezo ,3)=173

-1.©|<------D'11---------->©1'
2©|----D22'----->©2'
3©---------->D33<----------©3'

Lamb=(u/2π)(I/3)[1/4+ln(S11.Ia)+ln(S12.Ia)+ln(D13.Ia)-ln(D12.Ia)-ln(D13.Ia
D11= lamb 11=(u1/2π)ln[D11,D12,D13) ,exp 1/3/(r'D13DB)1/3
-insuctan e , L1=lamb/(1/3)=(3×2×10×10,exo -7)lb(D11.D12.D23)1/3÷(r'D12.D23)1/3
L2=lamb 2/(1/3)=(3×2×10,exp-7)ln(D21,D22,D23),exob@/3÷(r'.D12.D23)1/3]
L3=lamb 3/+1/3=(3×2×10.exo -7) ln (D31,D32,D,33)1/3(r',D23,D13)1/3].HM
Lavg=(L1+L2+K3)3 and ,L1+K2+K3)9H/m
-LT=(2×10,exp-7)(lb[D11,D12,D13)+D21,D22,D23)(D31,D32,D33]exp -1/8÷r .exp
3.S12.D13.exo 2,D13, exp D ....
©
©. ©

Xa=(2×10 exp -7)(3([1/4Ia+IaIn.D12/a+lbD13.Ia+IB.lbD21/a+IC.ln D
31.Ia)+(1/4.Ia+IA .ln D21./a+IA ln.d23/a].IV.lnD32.a+IC ln
DD12/a)+(1/4Ia+IalnD23/a+IA.lnD3+Ia-Ib.lnD13/a+IclnD23/a).IA,Ib,Ic
RMS,phase ,IA+IB+IC=,,D12=D21,D23=,vS 13= D32,
Lamb,a=+2×10.exp -7)(Is)/(3)ln(D12.D23)/a.a.a+3/4].Qb turn/

-L.dlux=(2×10 .exp -7[ln(D12,D13,D23),expb1/3÷r'],H/n

©<----------->©<----------->,© calcul ,
3,6m. 3,6m
1. 2. 3

L ,flux(2×10,exob-6).ln(3,5×7÷3,6).exp 1)3÷0,01=12,2×10,exo -6 ,H/m
Calcul inductive reaction
XL=377×12,2×10 exo -6,H/m × 1600m= 0,64 ohm

a1©-----D------© c2
V1©---------Db1.b2--------©
C1©. ©a2
GND=(Do1b1,Da1.b2.Da@.adb,D/a, db1,) expb1,

-aluminuim conductor steel reinforcement (ACSR(
-code|size|alum|out| resisC,|phase to n
Word| mil | aton|

Complex penetration depth
Drawing

o=√p/(jw), self impedance Zn,
Z,,=R1+JW×.uo÷2π×ln×2(N1+o)÷(GMR1,,,
JW,uo÷2π.ln.
Mutual impedance:
Zk=JW.yi÷2π.Lb.Djk÷Dk..
Dik=√(h-hk).exo +DL.dl.k

|ΔVu|. |[Zu][Zug] [Ky]
=
|Δvg|. [zu][zgf] [ig].
-voltage drop growing wire ,[Δvg]=0,
Zu÷zgg÷[u]

Drawing label:
Size conductor in wire solid ,scale 250,ruler ,/2,8 ,,
- reactance ohm scaling ruler ,1100, correction for multi conductor cable , single conductor in conductor in core , multiple conduct,.
.-aur earth , conductor core ,insulator

|Δv1a|. |Z11a, z12a,0,0,0, 0|. |Ia. |
|Δv2a| =|z12a,z22,0,Zab,9zac|. |I2a|
Δv1b	.	0, 0, z11b,z12,0 0.	.	I1b
Δv2b	.	0, Zab, z12b, z22b, zb		I2b
ΔV1c	.	0. ,0, 0. Z11A, z12		I1c
Δv2c	.	0,Zac , oBx , z12,Z1,		I2,c

-Δv1=ΔV,core - Δ v hearth ,,
-ΔV2= Δ V sheath
-I1= I core ,
-I2=I2 heath core ,
Z11A= z core out + z core / shear insulation+ Z sheath,
Z22= Z2 sheath out + z shear /earth insulation+z
Z12=-Z - sheath - mutual
-zab = z mutual earth - return on,
-zac = z mutual earth , return ,AC
Zbc = z mutual earth ,return .

Z mutual earth return
=Jwu÷2π{ln(aloha ×m×d÷2)+1/2-2/3ml
-cable buried ,M=√wju÷p

3.16 Explain : balanced charging 230Kv, 3Pg , transmission reactance ,0,2 m.pohn ,mi phase(0,32 ohm ,the line ,is 80 mi (28,7km)Lo
XC= 0,32÷28,7=0,0924m ohm
For voltage - in neutral , 239 × √3= 133kv , charge IC, (10 ,exp 3)(0,0925×10 exo 6)=53,2A

3.16. Explain:Data required: composition of EHv , transmission line -fault ----------

----------|types | 765 | WHV comp | 115KVOf

-substation ,Bus ,CA350,F2,,CBL0004
500, CBL-400, 2000A, CBLO,,1000A,
Feeder, diagram showing ,I Raley =Iprimairt÷NCT=1000A÷120=8,33A,

-Differential current fault extremely
600:5,CT,Rd,, 41,7A,,,7000,,58,3,,,100A,relay ,

-bus fault,
VCT=excitation volr ,
If=current ,.Ncf=current ratio
R lead =0ne,wayle,
KP=2,
RCT=current

_____
Sect 3.,
COGENERATION:
-Power output developed by turbine stages ,
-generator and mechanical losses , B
-Boiler feed and consent pump power conscience gross and fuel heat rate ,feed water heat balance .
Gas turbine based cogeneration plant ,gas turbine.

-superheater yes boiler yes steam generator,,
Steam turbine ,process steam extraction , separator yes , generator yes , feed water heater , condense , condenser.
-cogeeneration plant
-output : kj /kWh (Vtu/kWh), heat rate =(Q1-Q2)÷P
-Q1=cogeneration plant ,, Q2=conditional steam generator
-compressor , combust , heater recovery steam , dearect , condensation return ,feed water

- cogeneration plant cycle based on turbine as the primary expression efficiency =(P+H)÷Q1,plan

-Calculate procedure , divide into sections.

- calculation total power output in each section section power output =W1.ΔH1/3600,where .
W1=steam flow through section in kg /h (Lb/h,ΔH , enthalpy drop across section in kj /kg (Vtu/LB
3.calculate total power output,
Total power output =sum ,n ,t=w1,ΔH1,/360

-rehearer. Yes 349435kg/h 3336kj/k,boiler superheater 389687 ,,
Steam generation , Sja 2383kg/h,
High pressure turb, intermediate pressure turbine, low pression turbine 1,14MPa,159444kg/h,; 3245 kj/ yes ,process system ,,700kw, 1200kw,, mechanical generator ,, 94100kw generator,
389,687 kg/h , 1041kj,,, OTTD,Fw6, 5,5 DCS ,,822,9 KJ ,,, 0TTD fws ,5,5, process steam ,, 0,62 MPA 6748,, 2,8 TTD FW ,,4772kg , 355,6 KJ ,2,8TT ,FW ,, 2,8 TT fw, condenser

-STCP heat balance for 94-Mw generator ,SjAE= process plant steam jet ,air ejector ,P= MPa , measure ,pressure ,H =KJ/kg

...

-3.18 explanatjon :Electric energy economic method:
-regulated environment
-theory of the firm, P=f[Q],stating
-production costing
- project selected,,
-framework energy market step
1 regulation ,yes standard compliance reliability security =yes, iso yes , supplies yes primary, transmission yes , distribution Tess , exchange yes commodity cash future planing yes market brokers contract search ,
-P=f[A],
-Revenue (R)for compagny use expanse capital expense operating expenses is easy, R=P.Q
-supplies , capital cost operation maintenance, indivi

National Treasury EMail Disclaimer

For inquiries refer to case **Incident # 2164585** as your reference number

This is a system generated e-mail and is for confirmation purpose only.

Our service is also available Telephonically on +27(0)12 406 9222 and operates Monday to Friday, excluding public holidays from 08:00am to 16:00pm

Regards

CSD Contact Centre
+27(0)12 406 9222
csd@treasury.gov.za
https://secure.csd.gov.za/

CS

csd@treasury.gov.za 7:53 AM (2 hours ago)

to me

Dear Tshingombe Fiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #	**2164586**
Summary:	Re: This is to confirm that an incident was logged On: 2024/06/23 2:12:06 PM (UTC

	02:00) - Africa/Johannesburg
Customer Name:	Tshingombe Fiston
Location:	
Priority:	3
Status:	Logged
Category:	

Description

Important: This email originated from an external sender. Please do not click on email links or open attachments you did not expect. When in doubt, please contact the ICT Service Desk.

On Sun, Jun 23, 2024, 14:12 > wrote:
Dear Tshingombe Fiston,

Thank you for contacting National Treasury OCPO Contact Centre.

This email serves to confirm receipt of the query/issue you raised regarding your CSD.

The following new Incident has been logged for you:

Incident #

1900050

Summary:

re: letter explanation theoretical pratical base work , n diplomat award engineering electrical

Customer Name:

Tshingombe Fiston

Location:

Priority:

3

Status:

Logged

Category:

Description

Important: This email originated from an external sender. Please do not click on email links or open attachments you did not expect. When in doubt, please contact the ICT Service Desk.

-supplies , capital cost operation maintenance, individual suppliers curves work product cost .
(CP),,capital cost (k)
CP=g(k)+h(Cr)
Marginal cost production
(MCp) Derivatives of the cost production ,
MCp =dcp/dQ,
-Average cost production ,
(ACP)-Ia the cost ,ACp=P/Q
-total products cost indirect ,IL=R-Cp
Price , demand, supplies, supplies actual price , competitive, qualities,

-Ed=-(P ×.dq)÷dP×Q)
Ed>1, demand is constantly,
Cost of money,
Find weight cost ,IB°I0,percent
Stock interest rate ,IP=12% and return on common stock ,IC =15 ,percent , preferred stack, IC = 15 percent , fraction of bonds ,DR=50%, fraction stock CR=35%, prefferes stock , ratios fract preferres stock , PR = 15%

_ computer the cost of money the weight cost money (I)
I=iV.DR+IP.R+icCR=
I=(10)+0,5)+(11)(0,15)+(15)(0,359=12,05%

-equivalent and compound interest. cash flow (f),future value (P)%,rate of inflation (I,I) for future period (j) future period payment (n),
P=f÷[(1+i.i)..(I+in)]

-simplifie ,
P=f÷[1+I).exp]

Annuity = P=a(1/1)[(1+I)exp n -1]/([1+I),exp ,n
Inom =(1+1eff),exp ,m-1
I.eff=exp(Inom)-2), discount,
,sum of years digital depreciation ,cash flow,

----------_---------
-data declined balance
----------_----------
Year| remaining| annual. |accumulated
|Balance|. Depreciation | depreciatio
----------_-----_----------
1. |1,0. |0,40. |0,4
2.
3.
_____
Income stat for share holder
_____
Revenue 25000
Operating expenses. $350
Interest. 300
Depreciation. 600
Income tax 420
Total expense. $1675
Net. Income. 853
._____

-find breaker even loading between units value $ 17,55/mwg is found at 40 Me loadt onunit A,and $ 18,00/MWh is found at a 6 MW loading level on unit C ..

Data. |Unit A|. unit B | unit. C

Full load Mw. |50. |35. | 16
Heat rate. |1200 | 12500| 13,500
But/kW. |11,375|11,849|12,323.
Fuel price G , |1,50|. 2,09| 1,50
$MBTu. |1,58| 2,11|1,58.
Minimum loadMw|13 |. 10| 4
Incremental Hr
Minimum load kj/kWh ,10,550|11,100|11,
50% load kj /kWh |11,280|11,100,|111

100%loaskj/kW, 12,00| 12,500|13,00
Incremental fuel cost
Minimum load $ MWh ,15,84. |22,4|17,55
50%load $ MWh. 16,92 | 23,75 | 18,72
100%load $ MWh 18,00|25,00|19,0
----------_----------
Loading schedule for unit A,B, and

- system load | fuel cost | unit a|unit|unit

27. | 15,87. | 13. | 10| 4
39 | 16,92| 24 | 10|4

...

[

-3.20 . explain : find loading , daily load factor,ration of the load energy is in the the day to the energy represented by the daily peak dsmt multiplied by 24h fund the daily load factor LfD, when the daily - load energy is ,21GWH and the daily peak demand is 1000MW ,

- Multiply the peak demand by ,24 h (1000)(24) = 24,000 MWH =24,GWH,
- Determine the daily load factor LFD = 21GWH/24, GWH=0,875

-Annual load factor, annual peak demand, multiple by 8760 , estimate the annual load , factor demand daily,
LFA=LFD=0,875, motion the annual load factor demand daily,
LFA=LFD=0,875, motion average daily peak load to monthly peak load ,RwM =0,85 , motion of a average, monthly peak load to annual peak load RMA = 0,8

-LFA=LfD.RwM.RMA=(0,875)(0,85)(0,8)=0,595

-load management , purpose direct energy usage away from peak load period , method peak , sensitive rate structure and automatic control of power consumption load diversity find the annual load factor LFA ,when average , daily peak load is reduced ,5% from ,1000MW,to 950 MW , assume RwM=0,85 and RMA=0,8

-find energy associated with 950 MW for 24 h ,the energy is (959)(24)=22,800Mwh
Find resulting annual load factor with a daily load energy 0f, 21,000Mwh
LFA=LFD.RwM.RMA=(21,000/22,800)(0,85)(0,8)=0,62

-cosr stored energy available charging by conversion efficiency 70%,unit energy for discharge CDC=,
.-force outage rate ,generating unit that operated 6650 ,in one year 350h ,force outages and 1860 on schedules shut down ,
=For=FOH/(FOH+FOH=,force outage hour, ,,SH = service hours subtitut ,,
350÷(350+6650)=0,05=5%

-Energy available storage is (6)(50)(057)=210MWH
Savings from operating storage (SsT),for 18,9 Mila ,kWh,, displacement energy at 35 mils / kWh is
-Sst =210j(35-18,9)=$3381
Cost , discharge
_____

Plan. |plant cost| levelized fixe|total fixe
|$kw per y| 0, kWh per yr| y
_____
A,
B,
C,
_____
.-investment tax credit =(3000)(0,10)=$300, income taxes ,
Generate income statement to share holder .

-Revenie. 25000
-Operating expenses
-interest depreciation
-depreciatiob
Income tax

Total payable
Net income

Project selected ,rate of return / minimum attractive rate of return cash flow is method to estimate interested rate equivenlent for cash loan ,be purchased for $ 1500 with $500 down payment , assume that friend
- Amount barround , $15000
10, percent interest 2yr , $ 300
Bank's charge for arranging the $20
Total. $ 1800
Monthly payment. $ 1800/24=$75,85

-cash flow stream> +$1500 month and -$75,83 each month 2 to 24
2solve interested rate using present value for annual ratio founded
-75.83(P/a) exp .I..indice 24=7583(1/I)[1+I)[1+I].exp 24, 1j/[(1+I)= ,exp ,24 =1500
(P/a) exp.I . Indixe.24=1500/74,83=19,78
Assume an interest rate , I=2%
Error interest rate , €=19,78-18,91=0,87
find , errors,I=1,5%
€=19,78-20,03=0,25
0,87,indice ,I - 1,305=0,5-0,25i
I=1,612%
€=19,78-77=0,01,,1,612%

-data for cacul levilized cost
Year |annual cost | present value| Pres v
-. |$. |Factory. | P($
. |. [I/(+I). Exp .n
1. 400. |0,9091. |363,64.
2. 600. |0,8264. | 495,84
3. 800. 0,7513. 601,04
4. 1000, 0,6330. 682.00
5. 1200 0,620 745 ,08
_____
288,60..find accumulated depreciation each years
,sum j.d =[(1+I).exo -1]/[1+1).exp -1],, ¥.j=I.....n
n=2, accumulation is [(1+0,1)]/[(1+0,5).exp 5-1]=0,34398,
-annual depreciation expense,.dn=[i(1+I).exp n-1]/[1+1),exp n -1),, n=2, dn =[o,1(1.1) exp ,2-1]/[(1.1).exp 5-1]=0,18018

...

Explain: stationary batteries : 20Vdc, 1,2Vdc, current sizing constant power load 10kw , will be 116,lead acid battery with a nominal 1215 design , electrolyte for entire duty cycle ,-calculation
1.open circuit voltage,start of open discharge.
Eoc=0,84+specific gravity
Eoc=0,84+(1215/1000)=2,055
2.)det >> average volt per cell during discharge.
=(2,05+1,81)/2=1,93Vpc
-
3)det average battery voltage ,
=1,93×116cell=223,9Vdc
4) compute the current at ,
1=1000w ,1223,9V=44,7a DC ,
Rated calculation
-DC input kW ,: rated ,100kva ,at 0,8 power factor ,of 0,91 ,, eff sizing
KVA × of ,, 87,9

-10000/1,81×116)=47,6idc ,, Nicol ,, negative
Positive plate =1,/2
Current positive plover ,,:1,75,,a 25°c ,4 positive ,plate ×70amp /positive =280A, DC

-number of cells 48 volt system (42-vdc to. 56_ vdc maximum.

- compute a cell nominal lead cell , 2.0 vdc number ,cell 48/2=4 cell
- check minimum voltage line ,= V.lim /cell=(min.volt) /number of cells
42V÷24cell=1,75 /cell

-incorect size .

Cell size (positive plate) ,
= Maximum ,s=N,, s=1,, sum .P=s,,O=1..Ap-A(P-1)÷R.t

-sizing batteries.,ampere capacity, energy electricity economic method ,data cost of electricity calculation.

-LIGTHING DESIGN:

Luminaire,height ,90°,
Pitagore triangle ,D,H,point
E=(Cd)(cos45°)/(14,14)(14,14)
E=14,14 foot candle ,
E=(Cd)(cos ,3teta)/MH.h
-food candles ,candle power /distance

E=average illuminance foot candle
N=total number of lamp luminance constitute
LL=rated lumen output lamp ,
LF= light loss foot ,
BF=ballast factor
TF=till factor
A=lightef area .

Find the level illuminance.
500lux (50fc)
750lux (FC)
Lamp: lumen rating,LX (maintenance)=1/2(L.L area ,750 LX ,
750=1/2(LL/4.).exo 2 ,=24,00LL,=24,00
Height LL=54.,00Lm,A 400w,40000lumen LLD,of ,,0,77

-layout out door lightning ,40w,- high pressure sodium, 20m ,wide × 40m long ,10m,pole 40m

...

3.20Explain : assumed power output =94,100kw,operating ,,KVA= assumed power output/power factor
=94,1000kw/0,85=111,00kva ,generating ,=operating ,,kva×1,1=(111,00kva)(1)=122,000kva,
-mechanical losses =700kw , generator loss =
operating ,(KVA)(k1)/100.k2=(111,1000kvs)(1)/(100)(1,0)=1200kw
K1=1,1.....K2.

-cher h value of generator power output generator output (94,1000kw)+ mechanical losses (700kw)+losses(1200kw)=96,00kw

-boiler feed and condensate pump.
Pump calcul power , kW=enthalpy increase across the pump ,(KJ/kg)×mass flow (kg/s) base value ,
ΔH=694,3-6748=19,5kj/kg,,
W=9959+164,5321
159445+55,752=398,687,,,
BFP=(19,5kj/kg)(389,687kg/h)
(3600kj/kWh)=211kw,

-condensator pump ΔH=172,6-171,7=0,9/kg
W=139,223+22,977+2383=164,583 kg/h
CP=6,9kj/kg (154,583kg/h)/(3600kj/kWh)=41kw
-det power consumption of elect motor
Electric motor power consumption = 41kw÷0,85=48,5kw total cp

- gross power output , sum turbine section power outcomes mechanical generator loss - losses ,
96,000-700-1200=94,100kw
-net power ,gross power output - internal plan ,power consumption,

-feed water heater ,heater balance.
Write , balance for heater , 5××x line (4)×(100-line (8)]/100,line (6)×line (4)+(line (I)×line =line(I)×line(3)+(x+line(6), procedure is summarised,x =17,888kg

3.21 Explain:Lighting system for an indoor industrial area:

-a lighting system need design for a metal working shop area of the shop ,,12 m (50 ft)×60 m (200ft) conversation

---

Typical| typical| PCC|80|70|50|30|10|0
Lumin |intensi |PW|. |. | | |. |.
| Dist. |RcR|eff=|dn|up|lamp

LOw by| |
with
drop

High. |.
Bay
Open
Metal
Reflec

High
Bay
Open
Metal

Industrial while
,2×4,3 lamp trafficking

3.22 Explain: comparison of commonly used lamp type (HID type ,based on 400 - w ,size,
Lamp| initial|rate|lamp|Cu| burning| minut
| Lme|life| lumen| | posi|warp,hot
|Per. | |LLD|

Incad|20 |.100|0,89|high| any|0, o,,very,
Scent

Mercure|52,5|24.00|0,80|med|5-7, 3-6

Fluorescent|80|18.00|0,85|any,|0,0 low

Metal hol | 85-100|2000|0,75-80|higth

Sodium | 125. | 24,00 | ,0,90 | high ,any ,

Explain,
Characteristics of some popular lamp type
---__
Lamp type. | Initial | mean | rated | lumina

Incandesce| 320|. | 750 | 200
200W,A2
Insit frost
500. ,120V
500, 120v
1000,
1500, 130

Fluorescent|2950|2800|2000|6
Energy
saving
48-in
32wt8
---
9 Mercure
Phosphor
Called

Metal. | 41,00| 31.200|20.00|460
Holid
400w, 37
Clear

High

Pressure
Sodium
250 W,ED 18| 28.000|27000|24000|295

Explain:

LIGHT System for an out door area ,
Main height,
- highest illumination level produced away from a flood light location occurs when the maximum flood light candela value ,,
-3. Determine utilisation factor.
Area ,2 mainting height (2×10m=20m)
Height (4×10m=40m)long flood light is aimed ,13/10,

X÷MH=tan @÷cosπ

-Aiming line ,
Vertical angle , in line distance , maintenance,

-Lateral distance (x)÷maintenance (MH)

-foot candles /10.00 candelas ,
Mounting height =31,6ft,
Lux /10000 candle mounting height =10m
- calculat the level illumination
Average lux = (LL)(cu)(LLD)/area =(51.00)(0,4168)×(0,9)(0,95)1(20)(40)=22,7lx
-maximum averag Luz ,30,600w

Lumen distribution ,- isocandela , curves ,, photometric data for flood light in out door ,agree light design
---
Factor to consider : level for activity luminaire.
- light -loss factor light loss factor ,
-level of illumination, extensive information on selected appropriate
-ligthing source selection cost of energy to operate light .
-coefficient of utlization (cu) the coefficient of utlization important factor ,
- deternationof illumination categories

Level

A.public space. 30lx(FC)
B.simple orientation. 50lx(5fc)
for short visit
C.working space 100lz(10fc)
where simple
visual

Common visual task visual performance task commercial residential applications recommend
---
D. Performance of visual task of high contractor and large size. 300lx
E.performance of visual task high contrast
F.performance of visual task of flow contract ,500Lx(50fc),,,, 1000Lx (100fc)

G. Performance of visual task near
3.000 to 1000lx , 300to 1000fc
----------_--_-
Point is long aiming line is located 63°,or 2MH,this point is between the 0,8 - LX and ,1.0 line ,so the value ,0,9 can be give point a is ,10° above the aiming,point of 53° this matches the isocandela curve ,marked 400,the candela value this problem ,400, substituting , formula point a yield ,
-lux = (0,9)(400/1000)(90.000/1000)(0,88)(0,95)(1)=27,0lx
Point B,is located at horizontal angle of ,42 and the vertical angle is ,10° substitute in the formula,
Lux =(0,38)(400/1000)(90000/1000)(0,88)(0,95)(1)=11,5lx
,point c

-Roadway ligthning system:
Information already that street width is 20m the mounting height is 12m and the over hand of the luminaire is 2m the required overage maintenance level of illumination is 16 LX it necessary to. To determine the stagger spacing required to determine t staggered spacing ,require to provide the specific illumination level as well as the uniformity bof illumination with.

- explain. mounting height used in chart is 10 m to calculate the level of illumination at any point following
Lux=[lux(from chart)](Cd/1000)(LL)/(LF)(LLF)(MHct)
-lux (from chart) =illumination in LX /100cd
-cd=candela value taken from the photometric data isocandela curves at the same

horizontal and vertical angle as indicated by the chart must be corrected by dividing by 1000)

-total lumens falling on outdoors area lighting system.

Vertical. |. Horizontal angle

Zone | 0-10|.10-20|30-40|40-50|60-70-to

----------_----------

0-10. | 13,9.|14,6|13,9|8,1|. 58,6

0-10. | 19. 53,8

10-20|6. 37,2

20-30 |4. 27,3

30-40. |3. 18,4

40-50|. 2. 11,1

50-60 | 0,5. 0,5. 0,5.

Total right side. 208,4

Left side. 208,4

Total lumen 416,8

Total lamp lumen 1000

_____&

Estimated

LF=lamp factor , which correct the lamp lumens used photometric data to the rated lumens used in the flood light in this case LF=S1,

LLf=light loss factor = lamp lumen depreciation times luminaire dirt depreciation

MHCF= mounting height correction factor ratio of the square of the mounting used in chart height used of the mounting use in chart height used in the problem in this case , MHCF=100/MH.H=100/100=1)

-luminaire shape of the room ,reflectance of the room surface factor coefficient type , sample table for six commonly,

+- 10% recommend value ,

-purpoae ratio ligthning system , function of cavity ratio

- section ceiling cavity ,CCR=5hcc(Lrw)/Les ,room cavity ratio ,RCR=5hRc(L+W)/Lw

FCR=5hfc(L+w)/lWs ,,

Industrial location and task(0)

Very important some ,blank = not important or applicable,

-weding

-orientatiin

-pieciasion Manuel AC
- inspection of work after
- Manuel craft
- cutting ,pressing
Design ,issue: apperence and Lyman , daylight integration,direct glare ,flicker on stroble,intrinsic ,flicker ,ligth distribution, light, luminance of 100, reflected faces object v,reflected , shadow,source task,note special

...

[

On Thu, 06 Jun 2024, 22:19 tshingombe fiston, > wrote: -E and w for 250-w ,HP's lamp,KL°28,00lm ligth loss factor for roadway ligth l

3.22 -explain : illumination at test point P1and P2

Contributing|. rate for test point
Luminaire | transverse|longitudinal|illum
| ration. |Motion. |

P1. ,P2, P1, P2. ,P 1, P2

A. ,1,5. 1,5. 3,75, 5 ,0,88 0,6
B.

C
D. 0,167 0,61. 3,75. Tot 0,78

Minimum illumination value of 0,6 Luz occurs at point value is the initial value per ,1000 lamp lumens to convert to the actual maintenance illumination level use lux .
Lux = [LX /(Min) (LL / 1000)(LLD) (LLD)(MHCF) maintence height correction factor vMHCF Cana read from chart
Find (06)(28,000/100)(0,73)(0,93)(0,69)=7,87lx , average to minimum illumination level is therefore ,16/7.87=2.03:1 max

4.

Section engineering 4.

- job design explanation:SPU
Duty
Design : calculation for electrical design ,
SPU: design standards and guidelines:
-4.1 introduction standard , established minimum guidelines requirements Generating electrical on project electrical
-load calculation conductor sizing, conduit sizing ,motor branch circuit sizing ,power factor improvement, transformer primary and secondary circuit sizing, voltage drop,motor starting voltage Dipa ,short circuit analysis , ligthning level , grounding ,in substation where step potential are of concern , harmonic distortion analysis, cable pulling calculation ,generator capabilities motor starting.

-software :the electrical, design engineering SPU, approved software tools are :
-SKM power tools window software,basic tools Doppler load curt voltage drop , conductor sizing harmonic analysis ,size ,and several power switch energy.
-center one available from Rockwell automation for laying out motor control centre , spreadsheet may also used

-Calculation for electrical design:

Calculati|desc|required|Req|cond|Eng|ph
| |Tool|

Load |load. |skm|. |. |. |. |. 30/60/9
Facility. | each|ptw|
Switch. |load | dapee|
Gear. |Center: per net determine bus |protective devices circuit size
---
Load| load on each|
Panel|panel board|
board|NEC to set to determine panel, circuit any transformer

Generator,| to size |car,koheler
Sizing| base on calcul on critical run and star run and start load
---
Short |available fault|skm ptw dapper
Circuit|current at each bus to determine equipment short circuit interrupting rating
---
Conductor| to sizing circt
breaker| breakers and fuses |table hand

sizing|

Conduit| to size conduit and cable tray per NEC

fill
Tray size |.
_____
Transient| for starting
Motor. | Large motor
Starting|large determine

VFD, | for motor | 90cent
Reflective| from VFD
Wave

Lighting| may be performed specif
Protection|

Strike|
Distance|

- note suggested tools for use in SPu.
Projects
4.2.responsible party contractor -provided calculation may design engt - provide criteria
4.3.required conditionally requirements
4.4.basic requirements for electrical calculation
- non computer generated calculation must be on standard calculation sheet with the heading completed filled out
-calculation generated by computer programs must conform with the following procedure
-includ all heading information on each sheet ,
-insert comments wherever possibly to clarify to concept and actions taker in the compi input
- provide clear documentation of electrical geometry support conditions load application and load requirements,
-where practical , provide sketch of model indicated nodes , material , connectivity
- provide electronic copy on CD or other suitable device of analysis input and output with hard copy calcul
-provided manual checks of pertaining resultat.
.-coding liquid radiation force air ,
- voltage regulation: maximum allowable voltage dips
- operation prime standard
-voltage rating voltage ,non linear power factor with diversity multiple step of

-basic electrical engineering
Description: volts V=I×R,,power ,P=V×I,,P=I.I.×R
-AC single phase :
Volt ,= V= I×Z ,power factor ,of=cos π
Apprent power VA=V×I,reactive power VAR=V×I×sinπ
Real power=,,W=V×I×pf,,phase Angle ,Teta = arts (w/VARS)
-Power , phase angt ,Teta art (w/VARs)
Power factor , of = w/ (V×I)=w/A
-voltage drop ,Vd° 2×(I×R×cosπ+I.xsinπ)
Vs= voltage drop in circuit ,sin π= load reactive factor,
X= reactance
-AC , 3phase : KVA = (V×i×√3),,
KVA=√kw.kw+kvar.kvar
Real power ,kW= KVA ×cos, reactive power ,= kvar = kva×sinπ
Vs= voltage drop in circuit ,sin π=load reactive factor ,

X= reactance.

Motor , 2 horse power = 746 watts
- conditions a motor control centre with a total connected horse power 337hp CA be assumed to requirements ,337 KVA of input power conservation value large motor
Torque = (HP × 5250)/ revolution per minute (rpm)
Fan go ° (cubic feet per minute [CFM]×presure)/(3300×eff)
Pump ho = (gallon per minute [GPM] ×heas×specific gravity /(3960×eff) .motors (single phase .
HP=(v×i×eff×pf)/746
...

-4.6 explan ,HP= (v×i×√3×eff×pf÷746)
-sizs the capacitor need to increase the power factor from Pf1 to Pf2 with the initial KVA ,,
KVAR=KVA×(√1-pf1.pf1-pf1/pf2
×√1-pf2.pf2)
- load calculation sizing NEC 229,430 feeder conductor and protective devices , transformer panel board and switch board main busses motor control centre components service entrance device and conductor,
-load calculation must include all load ,the should be made by summing all of the load using appropriate diversity factor allowed by NEC art 229 ,that are connected to each panel board , switch board ,and motor control centre ,an allowance must be made for future load , growth the load for each branch of distribution system can the summed ,back to the service

-Generation sizing : software generator single or multi sets must be sized to supply maximum starting (SKVA),stead - state running (RkVA) and non linear (Gkw) demand of connected and future electrical equipment.
- information critical to the sizing and selecting.

-det include.
- environmental conditions elevation temperature indoor , outdoor
Noise obtatement requirements , muffler , enclosure silent ,
- fuel diesel gasoline nature gas
- fuel storage skid mounted tank ,day and remote tank
-
4.7 Explain conductor size ,general:
-general purpose branch circuit and feeders. ,art 220
-service entrance conductor ,art 239
-motore circuit. ,art 430
-air conditioning equipment. ,art 440
-generator. ,art 445
-transformers (primary and sect
-capacitor

4.8 Explain general requirements: sizing conductor two step process .
1.step is to look at the temperature rating of the terminal ampacuty of conductor be used match temperature rating.
2.the second step to look at the effect of ambient temperature conductor derative factor ampacuty
-inaulator used to cover wiring rated maximum temperature continuous , standard rating are 60,75°,90°,and 105°, current carrying capacity conductor.
-croas -section of the conductor , insulation temperature rating ambient temperature, copper 90°, test lab switchboard panel.
-load rated 43A, conduct containing conductor load running area ambient temperature high 42°, conductor are ,to copper THHN/RHWN insulation
Ampacity required=continuous board ×125% or 53,75 amp ,6 awg copper conductor Havit ampacity of amps correct terminal the circuit breaker services load houtsw , 31-16 , applied max. Temperature exceed 30°c ,
- Ampacity 6 conductor (THHN/THWN ,wet 75° Colum)=65amp
- corrected ampacity = 65 ×correctiin factor (82)=65×82,
53,3amo

Load of 200kva existing at 480V, with a power factor of 80% determine the amount of capacitor requirements factor to 95% =of=kva÷real power (kW)

-sizing procedure generator single multiset.
- prepare a load schedule,enter individual load characteristics in software,enter load in step sequence in software enter load in step sequence in software

-have software calculation
eff=efficiency,FLA = full load Amp ,GKw=non linear kW of connected load (s),LRA=locked rollor amp.
RPF=running me of connected load,RMA, reduce motor , starting factor ,SKVA=starting KVA of connected load (s),Skw=Starting kW of connected load (s) spf =starting power factor of connected load.

-resisti e loads : SKVA=RVA=Skw=Rkw
-ligthing loads (except for HD) ,SKVA=Skw÷Spf, RkVA =Rkw=RPF
-GID, ligthning loads = ,SKVA =0,75×RkvA, Skw=0,75×Rkw
-motor loads :SKVA=NEMA ×hp×746÷eff×spd×10000
-motor load 3-phaae) SKVA ,= LRA ×VL-Vl×√3÷1000)
VfD: Rkw=(drive -namwplate (HP)×646÷eff×1000
RkvA=drive -namw plate (HP)×746÷eff×pd×1000
SKVA = drive - name plate (÷eff
V.fD: Gkw=2.0Rkw
UOS: SKW=(ups-name plate (kW)+battery charging (kW)
RW=ups - name plate (kW)+battery charging (kW)÷eff
-ups GKW ,(3pulse) =2,50 §Rkw
Gkw(6pulse)=1,40×Rkw
Gkw(12pulse) 1.59×Rkw
10.reduced voltage motor starting SKVA=skva÷ RMs f
...

[

-Kva at initial power factor =√(KVA).(KVA)-(kW)(kW)=√(KVA)(kV)-(kva×pf)exp2,
KVAR=√(200kva)exp2-(160kw)exp2,kvar=√40000-25600=120,00kva
KVAR @95% power factor = √kw÷pf)exp.2-(kW) exp2-(kW).exp 2
√kvar =√(160÷95),exp-(160)exp,,
KVAR = √28,366-(25,600=52,6
-requires kvar for correction=120-52,6=67.4 kvar
-nec 460-8 criteria must met when sizing branch circuit conductor to capacitor first the ampacity of the conductor must be at least 135 the rated current of the conductor must be

at least 135% the rated current of the capacitor second,if the capacitor are connected to motor circt the conductor to the capacitor should have an ampacity not loss than on third the ampacity of the motor
branch circuit conductor , capacitor rates amps=15÷(48×√3)=18
-branch circuit amp =18×1,35=24,4minimum ,motor branch circuit amp =1.25×77=96,25
N0 I,AawG at 110Amp a 1/3 of motor branch circuit ampacity =110/3=36,7Amp.

- 4.7. explain transformers: primary secondary,art 450,600v, nominal electrical system design nominal,feeder breaker , sizing 250%
-Assume ,45Kva ,3phase ,480 v , primairy 208/20,
-primairy full load Amp ,45kva ÷((480v×1,73)÷1000)=54,2Am
Fe

National Treasury EMail Disclaimer

For inquiries refer to case **Incident # 2164586** as your reference number

58 of 10,016

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or by email at pcsupport@altum.com

tshingombe fiston <tshingombefiston@gmail.com>

---

project nfs

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tshingombe fiston <tshingombefiston@gmail.com> Tue, Feb 25, 2025 at 10:56 AM

To: tshingombe fiston <tshingombefiston@gmail.com>, tshigombekb@gmail.com

I-Corps Executive Summary ID :
P-09874
Academic Institution :
Engineering electrical tshingombe
Entrepreneurial Lead :
tshingombe tshitadi
Entrepreneurial Lead Email :
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I-Corps Mentor :
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Is your team submitting from another federal agency? If so, please select from the drop down below :
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Relevant current/previous NSF research award
Current/Previous NSF Research Award # :

Engineering
What is the IP status of the innovation :
Patent issued
Patent Number :
1234567891234567891
Brief Description of Technology (Intellectual Merit) :

Engineering electrical award degre diploma framework qualifications graduate resarch national trade diploma regulation certificate outcome job assessments enginering electrical master advance technologie implementation framework language..

Brief Description of Commercial Applications (Broader Impacts) :

Engineering electricsl frameworks low ruling irregularity regulation bsck log delivery

Brief Description of Current Commercialization Plan :

Planning auditing enginering electrical snf onformstion intellectual computer project ..portofolio

Status :
Declined
Submitted Date :
Dec 19, 2024
Email tshingombefiston@gmail.com
I-Corps Mentor Qualification :
Information
Should your team be invited to submit an I-Corps Teams grant proposal, who will be submitting the grant proposal as PI :
Entrepreneurial Lead (EL)
Is your team submitting from another federal agency? If so, please select from the drop down below :
Other Agency
There are two pathways to establish for the NSF I-Corps Teams program. Which is your team claiming :
Relevant current/previous NSF research award
Current/Previous NSF Research Award # :
Engineering
What is the IP status of the innovation :
Patent issued
Patent Number :
1234567891234567891
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Engineering electrical award degre diploma framework qualifications graduate resarch national trade diploma regulation certificate outcome job assessments enginering electrical master advance technologie implementation framework language..

Brief Description of Commercial Applications (Broader Impacts) :

Engineering electricsl frameworks low ruling irregularity regulation bsck log delivery

Brief Description of Current Commercialization Plan :

Planning auditing enginering electrical snf onformstion intellectual computer project ..portofolio

Status :

Declined

Submitted Date :

Dec 19, 2024

Dear tshingombe,

Here is the copy of the Project Pitch with reference number : **00095759** submitted to the

Advanced Manufacturing (M) on **12/18/2024**.

1. Submitter Email

tshingombefiston@gmail.com

2. Submitter First Name

tshingombe

3. Submitter Last Name

tshitadi

4. Submitter Phone Number

0725298946

5. Company Name

Engineering electrical tshingombe

6. Company Zip Code

10300

7. Company State

AK

8. Company Website

htpps//:www.tshingimbefiston.com

9. SBIR/STTR topic that best fits your projects technology area

Advanced Manufacturing (M)

Are you eligible and interested in being considered for the NSF Fast-Track program?

Yes

Please provide details of the NSF research funding relied upon to meet the eligibility

requirements, including: NSF research award number(s); the proposing company personnel
involved in each of the listed research awards and their roles in the research awards; and a brief
explanation of how the cited research funding relates to the proposed Fast-Track project. (up to
150 words)
Engineering electrical master skill ,manufacture
Please provide details of the customer discovery training relied upon to meet the eligibility
conditions, including: a description of the customer discovery training program(s), with
corresponding dates and award number(s) or other program identification details; a description of
the technology in relation to which the customer discovery was undertaken, and a summary of the
customer discovery findings. (Up to 250 words) Engineering electrical manucture electrotech
Please check the appropriate box below to indicate whether the proposing Fast-Track team will
be complete at the time of proposal submission.
Yes
10. Is this Project Pitch for a technology or project concept that was previously submitted as a full
proposal by your company to the NSF SBIR/STTR Phase I Program – and was not awarded ?
Yes
Please provide the Proposal Number of the previously submitted full NSF SBIR/STTR Phase I
proposal ?
1234567
Have you contacted the associated NSF SBIR/STTR Program Officer, via email or phone, to
discuss this prior full proposal submission?
Engineering electrical
11. Has your company received a prior NSF SBIR or STTR award?
Yes
Please provide the Proposal Number of the previously submitted full NSF SBIR/STTR Phase I
proposal ?
1234567
12. Does your company currently have a full Phase I SBIR or STTR proposal under

review at
NSF?
Yes
13. Briefly Describe the Technology Innovation?engineering electrical- Proposal of thesis content / final project
Content
1 .name of thesis
2.index
3. Introduction.
4.description .
5.general.analizing
6.current information .
7.discussion
8 conclusion.
9. Bibliography.

_____

1.Name of thesis : implementation and framework national qualification and national trade examination circulum experimental job theoretical pratical college and government policy LMS in engineering studies science electrical businesses module: case studies rsa in dhet,saqa , St peace college
2. Index: topic achieve research advance field basic field , essential filling research circulum, fundation intermediate,elementaire
3.Introduction : the core and research advanced field experience of sciences engineering electrical study and implement programme in social education and industrial trade vocational career productu sector in energy electrical and science engineering field system need to learn and re implement system information management system sector opportunity and through activities investment horizontal creation of equitable distribution: transformer science engineering and electrical product method learn capacity generative intelligence systems of linear regression models machine learning model for specific results reported that they haveA Mon other aspirations Isreal parameter real power factor and Imagineer power factor ,, need to resolved system exper and artificial intelligence system rural development system residential dispatch deployment system and framework qualification mean regulation humain resource and material work trade design career center to make system LMS factor adaptation between robot science trade elementary work trainer training phase products and systems industrial generator entrepreneurs in same order phase assessment news field and compensation.problem ask rural development need new training order framework to qualicafition requested requalification redesign

equivalents system , occupation framework system between national
framework qualifications instituts and national trading sector licensed
theory and practical in nature and creative abilities,
-typical evry country or landscape will be in a constant state of design
system in ,,,,
Large measure unpredictable and this city or village at different paint
of time ,, implementation the Grove years of failed turound ..
4.desceiption :at the heart of solutions to framework qualicafition and
national trade implementation sub sector training trainer experiementalwork place
industrial more student and instituts college trade years
external internal work value increase price macro economics instability
Crete ,.sice accentuated by advertising shortage high inflation levek
rising unemployment capacity industrial trademarks society system and
materials adequately support trade training QMS system information
commissioner,to under utilities in the address desterious policy design
implementation ,
5. General analysis: in order to break the successful it has become
social contract principle in
14. Briefly Describe the Technical Objectives and Challenges?Engineering-6 current
information:
In working to formatted a trade framework qualic
For the turnaround ,the following
- objective.
- the diagnosis the fundamental strategies instituts framework
qualicafition national equivalent national trade international sector
approval occupation council trade council engineering sector portal
career design to synchronise system adaptative sector LMS learner
engineering competition grade post senior principal, engineering
electrical ,tradesman wire ,cadet minim system up date successful system
in design grade operational, framework award qualifition research
undertake material test week conductor atom technical engineering
innovation learn teach research mark method marks need to implement
adaptative system , research topics circulum regulation irregularity
material script, backlog system , combination system ,printer and system
need to make synchronise system deploy generative job framework
undercover job in next generation must going
- to discern and isolate the sicio economic environment engineering
system trade safety security police , commissioner trade need to meet
requirements qualicafition framework and the framework must also show in
the social successful but framework it increases by outage loadshedding
and social down to declined empirical experiemental in other
contemporary ,the regret filled job no successful for time table printer

system or computers system experiemental make design advanced research ,
-7. discussion the objective is to explore that strategies and situation
where Rapide performance import. Trade theory..
- conclusion:
Whilst the field of strategy has be explored extensively in vast to
trade framework qualifications need to requalification system was
temporarily qualify expire system in job work sector training and
regulations system industrial system need cpd to continue system and
subject short and gate more skill job was slow operational field basic
in basic was poorly no attandance system advance essential field job
make support frame commissioner no meeting system trade retrade was not
in the same ways Orders orientation industrial, imperative hard, largely
,the research interest and how a fruit full common,ground can be
established.
- one of the critical virtues of the proposal thesis that it
Engineering electrical science make in order to stabilize thought
transfer the vei ld consensus building in ,,- the thesis is ,, model design
Policy commissioner vs learn vs teacher vs ,, framework national trade
vs company property intellectuel business electrical system need to
meeting...wrong model design topic ,, research rural energy design
framework , and orientation system learner teach career mentor
faciltor purpose framework,leaver school need to meeting,
Design two g city design systeme economic revenue bank system portal
need sector trade to work in place electrical designer b Poste trade
case research job workplace resulted was recruited need printer pool
position rank no waiting
- 8 bibliography:
- tshingombe 2023_2924 < Poe's published,,educ technology, magazine net
database, St peace college.
Record book completed
- web TVET dhet ,saqa wab
- alu
_____
Graduation procedure form . congratulations programme , diploma .
-1 data verification.
- grade | description| point | numeracy
15. Briefly Describe the Market Opportunity?
engineering electrical
16. Briefly Describe the Company and Team?
Engineering electrical master
17. How did you first hear about our program?
NSF email, webinar, or event

NSF SBIR/STTR Phase I Eligibility Information:
In addition to receiving an invitation to submit a full proposal from the NSF SBIR/STTR Phase I
Program based upon the review of their submitted Project Pitch,potential proposers to the program
must also qualify as a small business concern to participate in the program (see SBIR/STTR
Eligibility Guidefor more information).
The firm must be in compliance with the SBIR/STTR Policy Directive(s) and the Code of Federal
Regulations (13 CFR 121).
• Your company must be a small business (fewer than 500 employees) located in the United
States. Please note that the size limit of 500 employees includes affiliates.
• At least 50% of your company's equity must be owned by U.S. citizens or permanent residents,
and all funded work needs to take place in the United States (including work done by consultants
and contractors).• Primary employment is defined as at least 51 percent employed by the small business. NSF
normally considers a full-time work week to be 40 hours and considers employment elsewhere
of greater than 19.6 hours per week to be in conflict with this requirement.
• The Principal Investigator needs to commit to at least one month (173 hours) of effort to the
funded project, per six months of project duration.
For more detailed information, please refer to the SBIR/STTR Eligibility Guide by using https://www.sbir.gov/sites/default/files/elig_size_compliance_guide.pdf. Please note that these
requirements need to be satisfied at the time an SBIR/STTR award is made, and not necessarily
when the proposal is submitted.
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Here is the copy of the Project Pitch with reference number : 00098889 submitted to the Energy
Technologies (EN) on 2/25/2025.
1. Submitter Email
tshingombefiston@gmail.com
2. Submitter First Name
fiston
3. Submitter Last Name
tshingombe

4. Submitter Phone Number
0725298946
5. Company Name
Engineering electrical tshingombe
6. Company Zip Code
10300
7. Company State
AR
8. Company Website
https://github.com/Kananga5/Curriculum-section-1-1.1-Thesis.-Degree
honor-council-quality-rules-low-become-ju
9. SBIR/STTR topic that best fits your projects technology area
Energy Technologies (EN)
Are you eligible and interested in being considered for the NSF Fast-Track program?
Yes
Please provide details of the NSF research funding relied upon to meet the eligibility requirements, including: NSF research award number(s); the proposing company personnel
involved in each of the listed research awards and their roles in the research awards; and a brief
explanation of how the cited research funding relates to the proposed Fast-Track project. (up to
150 words) Thesis. Degree honor, council quality rules low become justice development court and labor relations conciliation mediation,
Engineering electrical trade research policy skill ,safety security
order develop ,defense order
1 .1.1 *Thesis:
* Research policy
trade theory minimum : legislation skill development :
*1.1.2Education technology,: Education engineering relate low
manufacture ..
Degree honorable ; college low labor justice ,
* Low relate literature traditional African LTA practical low rules
African
Convert unite international relate low rules European American curent in
unity language culture African rules
Please provide details of the customer discovery training relied upon to meet the eligibility
conditions, including: a description of the customer discovery training program(s), with
corresponding dates and award number(s) or other program identification details; a description of

the technology in relation to which the customer discovery was undertaken, and a summary of the
customer discovery findings. (Up to 250 words) Thesis. Degree honor, council quality rules low become justice
development court and labor relations conciliation mediation,
Engineering electrical trade research policy skill ,safety security
order develop ,defense order
1 .1.1 *Thesis:
* Research policy
trade theory minimum : legislation skill development :
honorable member certificate transcript outcome award
*overview : journal
* Key :
* Background:
*1.1.2Education technology,: Education engineering relate low
manufacture ..
Degree honorable ; college low labor justice ,
* Low relate literature traditional African LTA practical low rules
African
Convert unite international relate low rules European American curent in
unity language culture African rules
Low EIC, rules cebec rules ,UNESCO rules culture American culture NPA
,, accountability cultural science mathematics,Conte law USA ,UK
Australia ,national rules RSA sabs sans rules .
*College and university low Engineering rules :
Registration of low rules low congre low rules master cpd continue
developing skill master degree ,diploma continue topics rules ,unity
translate in African traditional mathematics usuel and Scotland UK land
UK and African land low rules integration reintegration accountability
research recharge system education technologie education technical
career and vocational career trade training trainer facilitator
moderator low assessor
Please check the appropriate box below to indicate whether the proposing Fast-Track team will
be complete at the time of proposal submission. Yes
10. Is this Project Pitch for a technology or project concept that was previously submitted as a full
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Yes
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proposal ?
1234568
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discuss this prior full proposal submission? 1..1 introduction : framework experimental nated ncv combination
Nated combination irregularity policy management system information
workbase experimental facilities moderator p
*1.3.2..3 Overview career libraries ,mentor facilitator library research
method book .
Low congre library,
*1.3.2..3.
3.1Key: about library research centre the mission of the low library of
congress is to provide authoritative legal research , reference and
instructions service and access to an resolved.
Established 1832 low library has a collection of over ,2,9 million
volumes spanning all systems and period of low and government all the .
* The library of congress provides congress admnister the national
copyright system and manage the largest collection of book recording ,
photography maps ,16 years authority record .
* Administration commercial ,low environment criminals low procedure
intelligence , property legal , .
* Broken down research court record .
* Grant proposal : non profit grant proposal date submission grant
submitted to asresss
_____
1.3.2..3.4.request for proposal :
4.1* education technology ,and master engineering electrical a,
Education Technical career Engineering .
*REP. |. Proposal | compagny
- 4.2 .project overview :
- 4.3 .project goals :
-4.4.scope of work :
-4.5 .current roadblocks and bariere.
- 4.6.evaluation metric and .
-4.7. submission requirements.
- project due |. Date. | Budget amount
-Contact : email.
_____
1.3.2..3..1.*Overview: national skill fund ,,and national research
fund. Career proposal
-1.2*dealine : local Engineering study in workplace jhb RSA. PretoriaMidrand. To

UK and USA ,10 December 2024.
-1.3* time frame : 5 years ,,to 2 years
- 1.4*limitations : principal career proposal career compte.
-1.5* submission by : Aiu research and. ,dhet saqa.
-1.6* instruction : pdf proposal and award policy (
PAPPGG),NSF..,,proposal certificate congre archive internet library
Award compagny. Aware ,,saqa aware ,dhet aware ,college aware.
-1.7.* minimum budget : 40000.0000 total program officer budge except.
Google budge apple
- 1.8* eligibility:
* Requirements : as of application ,hold degree field engineer trainee,
provide award type .
- preparatoration :
1.10.Review faculty early development:. allocation note:.
_____
- |documents| require|requirements|NSf
-cover projet | yes | begin withcareer|N/a
-project summary| y|following | N/a
-project descript| y |. | N/a
-result from | yes |.
-budget and|
- facilitator.|
-senior person|
- bibliography.|
Card board
- supplemtaire.
- past doctoral.
- research.
_____
1.3.2..3.1.11. project description : .
1.11.1 proposal sect research :
1.11.2. rational :
1.11.3. preliminary :
1.11.4 .data appropriate :
1.11.5.literaire where appropriate :
1.11.6. hypothesis overall :
1.11.7. questions research :
1.11.8 .description propose education activity integration:
1.11.9. description team and experience and expertise argument lock.
1.11.10. research / Education relevant for your career trajectory goal..
1.11.11 . limitations : conting plans .
1.11.12 . Expected outcome .

1.11.13. Definition of project of scussful .
1.11.14 distribution / delivery time research .1.11.14. measure planned or possibility resulted ...
---
11. Has your company received a prior NSF SBIR or STTR award?
No
12. Does your company currently have a full Phase I SBIR or STTR proposal under review at
NSF?
Yes
13. Briefly Describe the Technology Innovation?
evel disciplinary
1.2 .problem statement :
Implementating framework qualicafition system agreement statement over stay system education technologie and technical vocational engineering field in Engineering lecture and assessor conducted learner need to print in time outcome information and quickly statement ..of review marked and remarking
- purpose of study : research advanced field and research basic essential field system rurale need to implementating in new system. Energy of education technology era system council adoption low rules statement college distance learning courses subject issue teacher design framework and work framework with learner job. Team ..
1.3 .2 rational : idea logic approach methodic disciplinary hearing duty system of institution vocational and system management system information need resolved , idee job fractinel evidence low design information management system instituts police no meeting equivalent national exam and statement of result research out mark druip reason additional information irregularity system need to make reason quotion of job learner lecture agreement of same compensation insurance for aware certificate compliance hr resource to recognise certain factor idee no to monopolies education system but democratic liberalism of certain factor in examination criterial of course private system industrial..
-1.5 background to the study :
Ireviewed and over view system agreement continue framework attandance rurale school college time table more less agreement system policy academic organisation of national trade faculty and national framework qualicafition system internal working base system need to quickly factor policy dhet cat council award challenge policy college academic with engineering system theory and combination factor need theory to be agreed with internal14. Briefly Describe the Technical Objectives and

Challenges?power Systems and Renewable Energy
Optimization of Microgrid Systems
oInvestigating AI-driven optimization for hybrid renewable microgrids.
oCase study on cost-benefit analysis of microgrids in remote areas.
Smart Grid and Energy Storage Technologies
oEnhancing demand response strategies using machine learning.
oOptimization of battery energy storage for grid stabilization.
Wireless Power Transmission
oDeveloping high-efficiency resonant inductive coupling systems.
oApplications of wireless power transfer in electric vehicles.
2. Control Systems and Automation
AI-Based Predictive Maintenance in Industrial Systems
oMachine learning for fault detection in power transformers.
oPredicting failures in rotating machinery using deep learning.
Advanced Robotics and Control Algorithms
oAdaptive control for autonomous robotic arms.
oPath optimization algorithms for multi-agent robotic systems.
IoT-Based Smart Home Automation
oImplementing AI-driven smart home systems for energy efficiency.
oSecure communication protocols for IoT-based automation.
3. Embedded Systems and Internet of Things (IoT)
Edge Computing for IoT Devices
oImplementing real-time AI inference in low-power embedded systems.
oOptimization of edge computing frameworks for industrial IoT.
Wearable Health Monitoring Devices
oDeveloping ECG monitoring using flexible sensors and AI analysis.
Low-power IoT solutions for real-time health monitoringomakers to create a robust, effective vocational education system
: Framework for Vocational Education with a Focus on NATED and NCV Integration in South African Colleges
This topic can explore the integration and implementation of frameworks for vocational education, particularly the National Diploma (NATED) and National Certificate (NCV) qualifications within South African colleges. The research would focus on how these systems can be effectively combined to address challenges in vocational education, experimental facilities, policy irregularities, and workplace-based learning.
Introduction to the Framework for Vocational Education
Overview of NATED and NCV
oThe National Diploma (NATED) and National Certificate (NCV) are the two key qualifications within South African vocational education, designed to enhance the employability of students.
oThe NATED qualification offers a more academic-based approach, while

the NCV focuses on practical skills training aligned with specific trades.

Objective of Combining NATED and NCVoObjective: Explore how combining the NATED (academic) and NCV (practical) systems can provide a more comprehensive, holistic vocational education model.

oGoal: Enhance industry readiness and workplace skills by addressing policy inconsistencies, improving management systems, and ensuring strong work-based learning components

. Experimental Framework and Integration

Experimental Approach:

oIntroduce experimental frameworks to ensure both theoretical knowledge and practical skills are addressed.

oImplement real-world case studies, hands-on training, and industry feedback mechanisms to ensure the combination of theoretical and practical education is balanced.

Curriculum Structure:

oDesign curriculum modules that address both theoretical coursework (NATED) and practical skills (NCV).

oProvide a blended learning approach that mixes online learning, classroom lectures, and workplace training.

15. Briefly Describe the Market Opportunity?

Project Description (Research Proposal Structure)Project Description (Research Proposal Structure)

1.1 Proposal Section Research

Objective: This section should outline the primary aim of your research. It should highlight the problem you aim to solve or the gap in knowledge that your research will address.

oExample: "This research will explore the integration of machine learning in electrical power systems to improve efficiency in load shedding management."

1.2 Rationale

Why this research is important: Justify why the research is valuable, its social, economic, or scientific impact. Provide insight into the relevance of the study in your field.

oExample: "The study will provide solutions to the critical issue of power supply reliability in developing countries, where load shedding impacts industrial productivity."

1.3 Preliminary Research

Literature Review: Highlight key findings from previous studies in your field. This shows what existing research is available and where your work fits within it.

oMention gaps, contradictions, or opportunities that your research will address.
16. Briefly Describe the Company and Team?1.8 Proposed Educational Activity Integration
How this research integrates with education: Discuss how this project can be used in educational settings, either through curriculum development, workshops, or by providing a learning opportunity for students.
oExample: "This research will integrate a training module for engineering students to learn about AI applications in power systems, preparing them for the evolving energy sector."
1.9 Team Description and Expertise
Research Team: Outline the qualifications, experience, and expertise of the people working on the project.
oExample: "The team will consist of Prof. X, an expert in machine learning, and Dr. Y, an electrical engineer specializing in power systems optimization."
1.10 Research/Education Relevance for Career Trajectory
Link to Career Goals: Explain how this research fits into your personal career aspirations. Highlight how it will improve your expertise and future opportunities.
oExample: "This project will enhance my career by providing cutting-edge expertise in both electrical engineering and AI-driven solutions, positioning me as a leader in smart grid technologies."
1.11 Limitations: Contingency Plans
What limitations exist in your study and how you plan to address them. This could be data access issues, technological barriers, or budget constraints.
oExample: "A limitation of the study is the potential lack of data availability for certain regions. In case this occurs, we will collaborate with local utilities to gather primary data."
1.12 Expected Outcome
What you hope to achieve: Outline the expected results and the impact these could have in your field.
oExample: "W
17. How did you first hear about our program?
University tech transfer, VPR, or other administrative office
NSF SBIR/STTR Phase I Eligibility Information:
In addition to receiving an invitation to submit a full proposal from the NSF SBIR/STTR Phase I
Program based upon the review of their submitted Project Pitch,potential proposers to the program

must also qualify as a small business concern to participate in the program (see SBIR/STTR
Eligibility Guidefor more information).
The firm must be in compliance with the SBIR/STTR Policy Directive(s) and the Code of Federal
Regulations (13 CFR 121).• Your company must be a small business (fewer than 500 employees) located in the United
States. Please note that the size limit of 500 employees includes affiliates.
• At least 50% of your company's equity must be owned by U.S. citizens or permanent residents,
and all funded work needs to take place in the United States (including work done by consultants
and contractors).
• Primary employment is defined as at least 51 percent employed by the small business. NSF
normally considers a full-time work week to be 40 hours and considers employment elsewhere
of greater than 19.6 hours per week to be in conflict with this requirement.
• The Principal Investigator needs to commit to at least one month (173 hours) of effort to the
funded project, per six months of project duration.
For more detailed information, please refer to the SBIR/STTR Eligibility Guide by using https://www.sbir.gov/sites/default/files/elig_size_compliance_guide.pdf. Please note that these
requirements need to be satisfied at the time an SBIR/STT
Dear tshingombe,
Here is the copy of the Project Pitch with reference number : **00095759** submitted to the
Advanced Manufacturing (M) on **12/18/2024**.
1. Submitter Email
tshingombefiston@gmail.com
2. Submitter First Name
tshingombe
3. Submitter Last Name
tshitadi
4. Submitter Phone Number
0725298946
5. Company Name
Engineering electrical tshingombe
6. Company Zip Code
10300
7. Company State

AK
8. Company Website
htpps//:www.tshingimbefiston.com
9. SBIR/STTR topic that best fits your projects technology area
Advanced Manufacturing (M)
Are you eligible and interested in being considered for the NSF Fast-Track program?
Yes
Please provide details of the NSF research funding relied upon to meet the eligibility requirements, including: NSF research award number(s); the proposing company personnel
involved in each of the listed research awards and their roles in the research awards; and a brief
explanation of how the cited research funding relates to the proposed Fast-Track project. (up to
150 words)
Engineering electrical master skill ,manufacture
Please provide details of the customer discovery training relied upon to meet the eligibility
conditions, including: a description of the customer discovery training program(s), with
corresponding dates and award number(s) or other program identification details; a description of
the technology in relation to which the customer discovery was undertaken, and a summary of the
customer discovery findings. (Up to 250 words) Engineering electrical manucture electrotech
Please check the appropriate box below to indicate whether the proposing Fast-Track team will
be complete at the time of proposal submission.
Yes
10. Is this Project Pitch for a technology or project concept that was previously submitted as a full
proposal by your company to the NSF SBIR/STTR Phase I Program – and was not awarded ?
Yes
Please provide the Proposal Number of the previously submitted full NSF SBIR/STTR Phase I
proposal ?
1234567
Have you contacted the associated NSF SBIR/STTR Program Officer, via email or phone, to
discuss this prior full proposal submission?

Engineering electrical
11. Has your company received a prior NSF SBIR or STTR award?
Yes
Please provide the Proposal Number of the previously submitted full NSF SBIR/STTR Phase I
proposal ?
1234567
12. Does your company currently have a full Phase I SBIR or STTR proposal under review at
NSF?
Yes
13. Briefly Describe the Technology Innovation?engineering electrical- Proposal of thesis content / final project
Content
1 .name of thesis
2.index
3. Introduction.
4.description .
5.general.analizing
6.current information .
7.discussion
8 conclusion.
9. Bibliography.
_____
1.Name of thesis : implementation and framework national qualification and national trade examination circulum experimental job theoretical pratical college and government policy LMS in engineering studies science electrical businesses module: case studies rsa in dhet,saqa , St peace college
2. Index: topic achieve research advance field basic field , essential filling research circulum, fundation intermediate,elementaire
3.Introduction : the core and research advanced field experience of sciences engineering electrical study and implement programme in social education and industrial trade vocational career productu sector in energy electrical and science engineering field system need to learn and re implement system information management system sector opportunity and through activities investment horizontal creation of equitable distribution: transformer science engineering and electrical product method learn capacity generative intelligence systems of linear regression models machine learning model for specific results reported that they haveA Mon other aspirations Isreal parameter real power factor and Imagineer power factor ,, need to resolved system exper and

artificial intelligence system rural development system residential
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Large measure unpredictable and this city or village at different paint
of time ,, implementation the Grove years of failed turound ..
4.desceiption :at the heart of solutions to framework qualicafition and
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rising unemployment capacity industrial trademarks society system and
materials adequately support trade training QMS system information
commissioner,to under utilities in the address desterious policy design
implementation ,
5. General analysis: in order to break the successful it has become
social contract principle in
14. Briefly Describe the Technical Objectives and Challenges?Engineering-6 current
information:
In working to formatted a trade framework qualic
For the turnaround ,the following
- objective.
- the diagnosis the fundamental strategies instituts framework
qualicafition national equivalent national trade international sector
approval occupation council trade council engineering sector portal
career design to synchronise system adaptative sector LMS learner
engineering competition grade post senior principal, engineering
electrical ,tradesman wire ,cadet minim system up date successful system
in design grade operational, framework award qualifition research
undertake material test week conductor atom technical engineering
innovation learn teach research mark method marks need to implement
adaptative system , research topics circulum regulation irregularity
material script, backlog system , combination system ,printer and system

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undercover job in next generation must going
- to discern and isolate the sicio economic environment engineering
system trade safety security police , commissioner trade need to meet
requirements qualicafition framework and the framework must also show in
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system or computers system experiemental make design advanced research ,
-7. discussion the objective is to explore that strategies and situation
where Rapide performance import. Trade theory..
- conclusion:
Whilst the field of strategy has be explored extensively in vast to
trade framework qualifications need to requalification system was
temporarily qualify expire system in job work sector training and
regulations system industrial system need cpd to continue system and
subject short and gate more skill job was slow operational field basic
in basic was poorly no attandance system advance essential field job
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in the same ways Orders orientation industrial, imperative hard, largely
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established.
- one of the critical virtues of the proposal thesis that it
Engineering electrical science make in order to stabilize thought
transfer the vei ld consensus building in ,,- the thesis is ,, model design
Policy commissioner vs learn vs teacher vs ,, framework national trade
vs company property intellectuel business electrical system need to
meeting...wrong model design topic ,, research rural energy design
framework , and orientation system learner teach career mentor
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Design two g city design systeme economic revenue bank system portal
need sector trade to work in place electrical designer b Poste trade
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- tshingombe 2023_2924 < Poe's published,,educ technology, magazine net
database, St peace college.
Record book completed
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- alu
_____
Graduation procedure form . congratulations programme , diploma .

-1 data verification.
- grade | description| point | numeracy
15. Briefly Describe the Market Opportunity?
engineering electrical
16. Briefly Describe the Company and Team?
Engineering electrical master
17. How did you first hear about our program?
NSF email, webinar, or event
NSF SBIR/STTR Phase I Eligibility Information:
In addition to receiving an invitation to submit a full proposal from the NSF SBIR/STTR Phase I
Program based upon the review of their submitted Project Pitch,potential proposers to the program
must also qualify as a small business concern to participate in the program (see SBIR/STTR
Eligibility Guidefor more information).
The firm must be in compliance with the SBIR/STTR Policy Directive(s) and the Code of Federal
Regulations (13 CFR 121).
• Your company must be a small business (fewer than 500 employees) located in the United
States. Please note that the size limit of 500 employees includes affiliates.
• At least 50% of your company's equity must be owned by U.S. citizens or permanent residents,
and all funded work needs to take place in the United States (including work done by consultants
and contractors).• Primary employment is defined as at least 51 percent employed by the small business. NSF
normally considers a full-time work week to be 40 hours and considers employment elsewhere
of greater than 19.6 hours per week to be in conflict with this requirement.
• The Principal Investigator needs to commit to at least one month (173 hours) of effort to the
funded project, per six months of project duration.
For more detailed information, please refer to the SBIR/STTR Eligibility Guide by using https://www.sbir.gov/sites/default/files/elig_size_compliance_guide.pdf. Please note that these
requirements need to be satisfied at the time an SBIR/STTR award is made, and not necessarily
when the proposal is submit

I-Corps Executive Summary ID :

P-09874
Academic Institution :
Engineering electrical tshingombe
Entrepreneurial Lead :
tshingombe tshitadi
Entrepreneurial Lead Email :
Email tshingombefiston@gmail.com
Entrepreneurial Lead Qualification :
Engineering electrical
Technical Lead :
tshingombe tshitadi
Technical Lead Email :
Email tshingombefiston@gmail.com
Technical Lead Qualification :
Information technology
I-Corps Mentor :
tshingombe tshitadi
I-Corps Mentor Email :

On Tue, Feb 25, 2025 at 10:31 AM tshingombe fiston <tshingombefiston@gmail.com> wrote:

Thank you for submitting your company's Project Pitch to America's Seed Fund powered by the National Science Foundation - the NSF's Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Program. One of our program directors will review

your submission and send you feedback via email within approximately one month.

For you reference, your Project Pitch submission number is 00098889 and was submitted to the Energy Technologies (EN) SBIR/STTR topic area. Please be aware that your Project Pitch may be re-assigned and reviewed under a different topic area if determined to be better aligned with that topic.

Please make sure to check your inbox and spam folder frequently. You may also view and revise your submitted Project Pitch at https://nsfiip.force.com/mywork/s/my-pitch-submissions Please note that this link will only be available until your Project Pitch enters the review process.

Please visit our program website for more information about the Project Pitch process, review criteria, current SBIR/STTR Phase I solicitations, and upcoming informational webinars.

Please also note:

- If the proposed project is determined to be a good fit for the program's objectives of supporting innovative technologies that show promise of commercial and/or societal impact and involve a level of technical risk, the small business representative who submitted the Project Pitch will receive an invitation via email from the cognizant NSF SBIR/STTR Program Director or staff member responsible for reviewing your Project Pitch to submit a full proposal.
- If the proposed project is determined to be not responsive to the SBIR/STTR Program solicitation (please refer to the "Objectives Not Responsive to the Solicitation" section of the SBIR/STTR solicitation document), the potential proposer will receive a notice stating that the small business is not invited to submit a proposal.
- Project Pitches that are not invited for a full proposal may be resubmitted (with revisions to address any deficiencies) in the next submission window.
- Any small business with a pending Project Pitch must wait for a response before submitting another Project Pitch.
- Any small business that has received an invitation to submit a full proposal must wait for a resolution of the full proposal before submitting a new (or revised) Project

Pitch.

- A given small business is permitted to submit one Project Pitch per submission window (please refer to submission window dates listed at the beginning of the solicitation document). Having an invitation to submit a full proposal, or a full proposal under review, prohibits the submission of a new Project Pitch by a given small business, even in a subsequent submission window.

Should you not receive a response from NSF within approximately one month, please contact us at *sbir@nsf.gov*. Please include your Project Pitch submission number in the subject line of any correspondence.

Survey Overview

The National Science Foundation's (NSF) Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) proposal submission process recently changed. We would like to hear from you about this pilot process, which was created to reduce the burden on small businesses and NSF program staff.

The newly added Project Pitch requires a small business to outline the technical innovation, commercialization potential, and broader impact of their project before submitting a full proposal to NSF. Only projects that are determined to be a good fit for the program's objectives of supporting innovative technologies that show promise of commercial and/or societal impact and involve a level of technical risk (mentioned above and outlined on our website: https://seedfund.nsf.gov/) will be invited to submit a full proposal, therefore reducing the time and effort spent by small businesses in order to receive initial feedback on their potential fit with the program requirements. To gauge the effectiveness and clarity of this new process, we would appreciate your feedback.

Please note:

1. Your participation is voluntary.
2. Your individual responses will remain confidential and will be compiled with those from other respondents to improve the NSF's program.
3. Your answers will NOT affect the outcome of any current, pending, or future NSF funding requests.

This section asks about your familiarity with the program as well as your level of experience in applying to the program.

Question Title

*** 1-1. Has your small business submitted a full proposal to the NSF SBIR/STTR Program before?**

- ○ Yes
- ○ No

1-2. If Yes, how many full proposals has your small business previously submitted to the NSF SBIR/STTR Program?

SBIR/STTR Satisfaction Survey for New Phase I Solicitation - Proposers

Familiarity with the NSF SBIR/STTR Program

Question Title

* 1-3. How did you first hear about the NSF SBIR/STTR Program? [Mark all that apply]

- ☐ Conference
- ☐ Trade show
- ☐ Network (Professional or Personal)
- ☐ Consultant or Service Provider
- ☐ Angel Investor
- ☐ Venture Capitalist
- ☐ University Business Incubator or Accelerator
- ☐ State Economic Development Office
- ☐ Small Business Administration
- ☐ United States Patent and Trademark Office
- ☐ Grants.gov
- ☐ NSF.gov
- ☐ Social Media - Twitter, Facebook, LindkedIn
- ☐ Others (please specify)

Question Title

* 1-4. How did you first learn about the new Project Pitch requirement? [Select only one]

- ☐ NSF Solicitation
- ☐ NSF SBIR/STTR website (https://seedfund.nsf.gov)
- ☐ The FAQs section of the NSF SBIR/STTR website

- ☐ Email/Phone call with NSF staff members
- ☐ Webinars
- ☐ Presentations from SBIR/STTR Program Directors
- ☐ Others (please specify)

Question Title

*** 1-5. Out of all the sources, which is the most helpful to you in learning about the new step or in submitting a Project Pitch? [Select only one]**

- ☐ NSF Solicitation
- ☐ NSF SBIR/STTR website (https://seedfund.nsf.gov)
- ☐ The FAQs section of the NSF SBIR/STTR website
- ☐ Email/Phone call with NSF staff members
- ☐ Webinars
- ☐ Presentations from SBIR/STTR Program Directors
- ☐ Others (please specify)

50% of survey complete.

Powered by

Process Satisfaction

This section asks about the overall submission process and the length restrictions on the Project Pitch.

Question Title

*** 2-1. How easy or difficult was it to submit your Project Pitch *via* the online form?**

- ○ Very difficult
- ○ Difficult
- ○ Neither difficult nor easy

- Somewhat easy
- Very easy

Question Title

* 2-2. Do you agree or disagree with the following statement?
I understood what I was asked to submit in the Project Pitch.

- Agree
- Neither agree nor disagree
- Disagree

Question Title

* 2-3. Approximately how long did you spend in preparing and submitting the Project Pitch?

Time (minutes):

SBIR/STTR Satisfaction Survey for New Phase I Solicitation - Proposers

Process Satisfaction

Question Title

* 2-4. The Project Pitch was limited to approximately 3 pages. Did you think this limit was too long, too short, or about right?

- Too long
- Too short
- About right

Question Title

* 2-5. The Technical Innovation section of the Project Pitch was limited to 500 words. Did you think this limit was too long, too short, or about right?

- Too long
- Too short
- About right

Question Title

* 2-6. The Technical Risk section of the Project Pitch was limited to 500 words. Did you think this limit was too long, too short, or about right?

- Too long
- Too short
- About right

Question Title

* 2-7. The Customer Profile and Pain Point(s) section of the Project Pitch was limited to 250 words. Did you think this limit was too long, too short, or about right?

- Too long
- Too short
- About right

Question Title

* 2-8. The Background and Current Status section of the Project Pitch was limited to 250 words. Did you think this limit was too long, too short, or about right?

- Too long
- Too short
- About right

75% of survey complete.

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See how easy it is to create surveys and forms.
This section asks about the technology area of your small business, and whether you have had any interaction with NSF SBIR/STTR Program Directors before submitting the Project Pitch.

Question Title

* 3-1. Which of the following best describes your research or technology areas? [Select one]

Question Title

* 3-2. Did you have any interaction with the NSF SBIR/STTR Program Director(s) prior to submitting the Project Pitch?

- Yes
- No

My Submissions

Navigation Mode

S

00098889	fiston tshingombe	tshingombefiston@gmail.com	07252989
00097898	fiston tshingombe	tshingombefiston@gmail.com	072529894
00095759	fiston tshingombe	tshingombefiston@gmail.com	0725298946

Executive Summaries below.

My Submissions

Navigation Mode

Sort b

P-09948	Atlantic international university	fiston tshingombe	fiston
P-09874	Engineering electrical tshingombe	fiston tshingombe	fist

Thank You,

The NSF SBIR/STTR Team

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We'd love to get your feedback on our pilot Project Pitch process! If you have a few minutes, please take our anonymous survey. The survey asks a few questions about your familiarity with our program and satisfaction with the process. Your responses will help us to improve the process, quality of our services, and user experience going forward. Thank you in advance for your time!

4.,n3;n5 n6.. ; quality insurence body irregularities in pr...

Transcript Requests <transcripts@uct.ac.za> Tue, Apr 2, 2024 at 8:56 AM
To: tshingombe fiston <tshingombefiston@gmail.com>, "Thaga.d@qcto.org.za" <Thaga.d@qcto.org.za>, "mabunda.l.l@qcto.org.za" <mabunda.l.l@qcto.org.za>, Central Office <centraloffice@qcto.org.za>, "saqainfo@saqa.org.za" <saqainfo@saqa.org.za>, QCTO Verification <verification@qcto.org.za>, "verifications@saqa.co.za" <verifications@saqa.co.za>, "verificationsletter@saqa.org.za" <verificationsletter@saqa.org.za>, "verifications@saqa.org.za" <verifications@saqa.org.za>

Dear Tshingombe,

Thank you for your email.

Please note that our office has received 11 emails in 5 calendar days and it is not clear from all emails what is needed.

An official transcript is a full record of your academic activities at the University. It is produced by the Student Records Office only and contains the stamp and the signature of an authorised University official to ensure authenticity of the document. The official transcript is confidential and only issued upon request and authorization of the student using the instructions below:

STEP ONE: DOWNLOAD AND COMPLETE THE ACADEMIC TRANSCRIPT REQUEST FORM

The form can be downloaded from our website:
http://www.students.uct.ac.za/students/current-students/student-records/academic-records

Click on *Official Transcripts* and under the *Downloads* section on the right-hand side, the request form can be accessed.

STEP TWO: MAKE THE PAYMENT

The Treasury Office within UCT Finance has taken the precautionary measure to close the cash office until further notice. Please select one payment method to the Student Records Office as follows:

STUDENT RECORDS OFFICE BANKING DETAILS
Bank: Standard Bank
Account Name: University of Cape Town (can be added as a Public Recipient)
Account Number: 071503854 (Current) *If available, select the Sundries Account*
Branch Code: 025009

PLEASE INCLUDE THE REFERENCE NUMBER: 11195/Initials & Surname or UCT student

number (e.g., 11195/AB Jones)

1. METHOD ONE: ELECTRONIC FUND TRANSFER (EFT)

Please use the banking details above and send proof of payment to yourself as an emailed notification and download the PDF to your device.

2. METHOD TWO: ONLINE PAYMENT GATEWAY

If you would like to pay via credit card (American Express, MasterCard or Visa only), please click the link for instructions to make an online payment:
https://uct.ac.za/sites/default/files/media/documents/SRO_CARD_PAYMENT.pdf

3. METHOD THREE: (FOR INTERNATIONAL CLIENTS ONLY) WIRE TRANSFER

Where payment is being made from outside the rand currency area, payment can be made by telegraphic transfer into the Student Records Office bank account (see details above). The Swift code is SBZA ZAJJ.

STEP THREE: EMAIL THE COMPLETED REQUEST FORM AND PROOF OF PAYMENT

Please attach the request form and confirmation of payment as a PDF document and email it to transcripts@uct.ac.za

Requests will be processed within 4 working days and courier delivery will be made in 2-5 working days thereafter (depending on location).

PLEASE NOTE

1. Once your request has been received and **if you have paid for courier delivery**, our office will send you with a Google form link to confirm the courier delivery details (contact person, contact number and physical address). If you have not received the tracking number from the courier company within a week of completing the Google form, please follow up by email.
2. Transcripts requested for delivery to **World Education Services must include a clear scanned copy of your hard copy degree certificate/s and WES form/s** so that we can adhere to WES requirements. We are able to submit your documents electronically.
3. The Records Office **does not offer a secure file transfer delivery method**, your transcript can be emailed directly to an institution. Please include the institution's email address and necessary reference number if available.

4. Records are not issued to currently registered students until examination results are finalised by the FEC/SEC.
5. Transcripts will not be issued to students or alumni who owe outstanding fees for past or current studies or those with open disciplinary cases against them. Please send our office an email for more information.

To speak to a consultant in the Student Records Office, please contact us on +2721 650 3595 should you need any further information or assistance.

Regards,
Nicole Forbes
Records Assistant

STUDENT RECORDS OFFICE
***Location**: Level 4, Masingene Building, Cross Campus Road, Middle Campus, University of Cape Town, Rondebosch, 7700.*
***Google Maps directions** to Masingene building: https://goo.gl/maps/MUFhXwnHiy5RGXXz7*
***Office Hours:** Monday to Friday: 08h30 to 15h30. We are not open on public holidays or weekends.*
***Phone Number:** +27 21 650 3595*

From: tshingombe fiston <tshingombefiston@gmail.com>
Sent: Thursday, 28 March 2024 22:12
To: Transcript Requests <transcripts@uct.ac.za>; Thaga.d@qcto.org.za <Thaga.d@qcto.org.za>; mabunda.l.l@qcto.org.za <mabunda.l.l@qcto.org.za>; Central Office <centraloffice@qcto.org.za>; saqainfo@saqa.org.za <saqainfo@saqa.org.za>; QCTO Verification <verification@qcto.org.za>; verifications@saqa.co.za <verifications@saqa.co.za>; verificationsletter@saqa.org.za <verificationsletter@saqa.org.za>; verifications@saqa.org.za <verifications@saqa.org.za>
Subject: Re: appeal application qualification occupation n diplomat award dr congo leaver 2016 submission and transcript certificate record supplementary .;.rsa completed n diplomat studie engineering n4.,n3;n5 n6.. ; quality insurence body irregularities in pr...

CAUTION: This email originated outside the UCT network. Do not click any links or open attachments unless you know and trust the source.

-state explain displacement node point wave particle ..double antinode excited quartz chancd photo acoustic spectrophone differing the fundamental flexure movs .
- explanation ;antinodes oscillating in counter phase excite resonance antinode points simultaneously two laser beam if their phase shift.

-make labell spectrophone schema DAE ..and explain ..beam dector split monor ..□□□ beam □□□□□□□□□□□□□□□□□□□□□detec□□□□□□□□□□□□□□□■□□□□□□□□□□□□■■□□□□□□□□□□□■■□□□□□mirror□□□□□
- explain laser emmitting 1,37 um H2o absorptionbline located at 7306,75 cm with a line .intensity of 1.8 ×10 exp -20 cm /mol phasw compensation adjust the phase beteen two laser beam passing m rs in order .
- explain what are require the accoustic resonance an occure explain ..
Their spacing is equal is equal to an number of half wave lengths in thes condution antinode maximum of the surface with one ..labal node ..N=node .
- wath mean expression formulae

|><| node anti node
 ..velocity of sound and n = q,2,3 frequence resonance f=n×c÷2zl..
- solve given solution taking 1 a 5 m the resonant frequences are 34,68 : 102 hz can result in a boa mine extrem case .spacing say 1=40m ..
f=C÷2[(P÷l)(P÷l)+(q÷w)÷(q÷w)+(r÷n)(r÷n]exp1÷2×(8,20)

- explanation low absorb using anti resonant make labell
[]>>>k>>>□m□>>>>>om

[K+K)-w.wM]x-ky=fo(w-kxt+[k-w.wM].y=0
-w1=; wo=sw; w2=wo+sw...2w÷wo=..wo=square root

tshingombe fiston <tshingombefiston@gmail.com> Tue, Jul 23, 2024 at 3:03 PM

To: verificationsletter <verificationsletter@saqa.org.za>

Dear tshingombe

Section 29(a) of the Policy and Criteria for Evaluating Foreign Qualifications within the South African NQF, as amended (March 2017) stipulates the requirements that a foreign awarding institution must meet for its qualifications to be recognised.

SAQA bases the advice below on information currently available to it. SAQA reserves the right to change this advice should new authoritative information come to its attention.

Our online application document stipulates the following in terms of schooling qualifications:

"SAQA accepts only school leaving qualifications issued by the official examining / certification

body in the country of origin, and not by the school, where based on external examinations.

No Certificates of Evaluation will be issued for school leaving documents other than those in respect of completed, national school exit qualifications issued by the relevant authorities."

Therefore, only school leaving qualifications correctly awarded by the authorised national examination body in the Democratic Republic of Congo will be recognised and not school leaving documents issued by the school itself.

Please note the purpose of this overseas institutions email is to give people some direction regarding accredited and non-accredited foreign institutions for the purpose of recognition and acceptance by SAQA for foreign qualifications evaluation.

Kind regards

Authentication Services

SAQA

The National Qualifications Framework (NQF) Act 67 of 2008 mandates SAQA to provide a foreign qualifications evaluation and advisory service, which it does in accordance with the Policy and Criteria for Evaluating Foreign Qualifications within the South African NQF, as amended (March 2017). Section 29(a) of the Policy and Criteria stipulates the requirements that a foreign awarding institution must meet for its qualifications to be recognised.

On Thu, Jul 18, 2024 at 3:15 PM verificationsletter <verificationsletter@saqa.org.za> wrote:
Good day,

Thank you for your message.

However, this type of message is dealt with by SAQA's Ratification of Foreign Qualifications.

Please direct any further correspondence to dfqeas@saqa.co.za and ceeq@saqa.co.za Or alternatively you may telephone 012 431 5000/5070.

Thank you for your cooperation in this regard.

Kind Regards

From: tshingombe fiston <tshingombefiston@gmail.com>
Sent: Friday, July 12, 2024 4:41 PM
To: Transcript Requests <transcripts@uct.ac.za>; David Thaga <Thaga.d@qcto.org.za>; mabunda.l.l@qcto.org.za <mabunda.l.l@qcto.org.za>; Central Office <centraloffice@qcto.org.za>; SAQAInfo <saqainfo@saqa.org.za>; QCTO Verification <verification@qcto.org.za>; SAQA Verifications <verifications@saqa.co.za>; verificationsletter <verificationsletter@saqa.org.za>; SAQA Verifications <verifications@saqa.org.za>; tshingombe fiston <tshingombefiston@gmail.com>
Subject: Re: appeal application qualification occupation n diplomat award dr congo leaver 2016 submission and transcript certificate record supplementary .;.rsa completed n diplomat studie engineering n4.,n3;n5 n6.. ; quality insurence body irregularities in pr...

On Fri, 29 Mar 2024, 18:01 tshingombe fiston, <tshingombefiston@gmail.com> wrote:
Pupose:lms support .. topic and research framework qualification scope council trade topic test exam n1,n2,n3,n4,n5,n6
Project topics relate supplie circuit
Textbook self assessments peer group assessment..approach logic industrial .
Base abstral case module study ..advantage module disvantage module research subject trade
-Topics test exam 1: explain 2.a. +3b.b=4c.c...
A=3,+4...
-discuss log 8 base 8+log16bass =log 50.base ..
_explain lim x to 2 . 2x.x+4÷x+4..
Calcule value of ...matric[1,0,0]
Integral .to 2 - 2 ..3x-9÷3×+6dx..

-Topic explanation :..V=r.i A=3,14..
□□□

□□□□□□□□□□□□□□□□□■■■■□□□□□□□□□□□□□□□□□□□□□□□□□□□■
Explanation vector steam electrolyse compare kinematics equilibrium incline plan friction dynamic engineering load structure solide liquid gaz physic ....
S= distance time take average final f= mg+ ma ..f=m.ac ..f1+f2...fu =mq.g1..ma=mg...Q=m×c×t1-t3..
Topics ; a=v.u ÷t....w=m.g ..
Efficiency ma / dr ×100% ..
E/ssrie condensator bq/c ..serie ..c serir .. parallel .
□□■■■■□□□□♤■■■
■■■■■■■■■■■
Regulation load machinery quality fail to conservation check ignition compressiin AE=w-U input energy system thermal..
dw÷dQ..dA÷d×(w-e)-(w-u)...hg+mg+z=energy .E=m×c ..Ek=2÷2m×h×g..
□□□□□■■□□□□□□□□□□□□□□□□□□□

Z.z=x.z!R.R...symetriczl find fault ..
□□□

line .intensity of 1.8 ×10 exp -20 cm /mol phasw compensation adjust the phase beteen two laser beam passing m rs in order .
- explain what are require the accoustic resonance an occure explain ..
Their spacing is equal is equal to an number of half wave lengths in thes condution antinode maximum of the surface with one ..labal node ..N=node .
- wath mean expression formulae

|><| node anti node
..velocity of sound and n = q,2,3 frequence resonance f=n×c÷2zl..
- solve given solution taking 1 a 5 m the resonant frequences are 34,68 : 102 hz can result in a boa mine extrem case .spacing say 1=40m ..
f=C÷2[(P÷l)(P÷l)+(q÷w)÷(q÷w)+(r÷n)(r÷n]exp1÷2×(8,20)

- explanation low absorb using anti resonant make labell
[]>>>k>>>□m□>>>>>om

[K+K)-w.wM]x-ky=fo(w-kxt+[k-w.wM].y=0
-w1=; wo=sw; w2=wo+sw...2w÷wo=..wo=square root
K÷M
[Alpha 2]exp T ..[square roor beeta.q].[zlpha]
...xp(wo)÷x(wo)=1÷2((1÷sw÷wo)_1(sw÷wo-i)
-explain oscillation simple make labelled harmonics formulae pendul period ..
[S] ; T=2pi ..sq root L÷g
□□□□□□□□□□□□■■■■□□□□□□□□□□
□□□□■■■■■■■■■■■■□□□□□□□□
Mass spring period ..[s]T = 2pi .sq root m÷k ..kg ÷kg/s.s
□□□□□□>>>>>□□□
X=-A....
-low period frequency ampli2 displacement and phase
differences displacement amplitude period (T) frequence.
- Design : displacement of oscillating object specific time equilibrium
-maximum : displacement of the oscillations object .
-time take for
-number of time second f=1÷T.
-energy tramsfer wave ..condition simple harmonic when body is from equilibrium there musr exist a restaring force that want to pull the bodu back to equilib3.
- the magnitude of the restoring forcd must be proportional to the displacement of body ..
- a travelling wave .is a continuouse disturbance in meduim caractere a rope thar flicked uo and down cintinously create a repeating distrurbance similar to shape of a sine ..
- calcule wave lengtg frequency periode abd wave speed propertie speed source 50Hz wave lengtg 600m , y = 50×600=3000m/s..
Make label wave caracteris3.wave front a ligth ray ..plane wave

- explain amplitude intensity wave depend it depend on it energy wave is proportional to square of it amplitude 100..
Explain constructive deconstruction wave constructive interferencd superposition where twi add 1+1=×rigtg deconstruction superposition .
- polarizTion ligtg is a transverse wave polarzation only occur to transvers wave of lenth ref to orientations.
- calculate refraction solution.
tan(¤)=n2÷n2=60÷39=2..labelled refractoral polarise rare meduim denser meduim refraction.
-calculate polarize ligtg filtered in labelled ..
I=Io×cos.cos $= ..4 cos .cos 60=
- explain wave reflection and refraction plan labelle angle incide ..angle of reflection incoming rf ..
- explain low snell a formulae ..n1÷n2=sin ¤2÷sib1....normal angle of incidencd ..angle of refraction .refractii ray ..
change direction wave transmit .
□□□□□□■□□□□□□□■■□□□□□□□□□□□
-explain define electrostatics ..electrostatic is the theory of the electric field in condition which it behavior .
- explain particle for mulae charge ..F=R..Fo×q1.q2÷R.R..
C.C÷F/m.m=C.C/F.m=C.C/C/V..=C.V/m=j/m..newtow
F=q2.E1 electric field intensity Eq.ossociated F=q1.×q2/4×1. 14×€×R
oo---->o------>>F
□□□□□□□□□□□□■■■■□□□□□
- explain combining result : E1=R^.q1/4×1,14×€×R×R...vector begining the particle ..€=€o..r=1 ..E(r)=r^(1,44kv/m) Large engineerinf electron is nkt readly apparente istancr eayal positive charge field to point charge E(r)=r^.q1/41,14..
-explain distribution of charge ..qn = pi (rn) .A..Er ()= 1/4×1,14€×sum n=1×r-nr÷r-rn)×pL(r×n).delt.L
□□□
..
Calcul electric field a long r'=^p. ..r'=p.a ..
|r_r'|= sqr a.a×z.z polar field
- explain low gauses : field associate ..integral 1.14 to teta ..integral 2 ×1,14 to teta ..D (r.r×sin teta ×d.teta.d.phy..
Using implet symetry argyment D.can depend r the charge particle ..
r.rD(r).integrall .1,14 to teta = O ..integral 2×1.14 d = sin d.dteta.dteta.=a vector ..D=r^..q÷4×1,14×r×r..
□□□
- explain force the force experience by a particle at location bearing charged q.in electric field intensity E ..is Fe=q.E(r)..f f space potential energy energy the loss quantifie using delta .w =delta L. different.
Explain energy delta w..qE(r).idelta l.give work only short distancr ..

W.sum .n ..to n=1.Delta w..w..q sum N.n=2...
W=q.integral E.(r).^i(r).dl...
W=q integral..E.dl...dl=idl..
Work done by transversing variation delta =w÷q, =- .integral .E×dl
□□□□□□□□□□□□□□□□□□□□□□□□□□□□■■□□□□□□□□□□□□□□□□□□□□□□

- explain integral = .E×dl..curve at point and at point 2 be indentifie vector rq, r2 ..
V.2.2=integral r2 to r1..E× dl
W.2.1..=q.×V2.I
Explain kirchof :
W2.1=w2-wq....V2.1=integrall
- explain low poisson and la place equation electrical potential field
(v(r)computer ..V2.I=V.(r2)-(r1)..and abilty fiels gradie5 ..integration..
V^×E=V÷e...
□□□□□□□□□□□□□□□□□■□□□□□□□□□■□□□□□□□□□□□□□■■■■■□□□□□
Operation posson cartesian matrice
V'.v=[derive partial d÷dz.x^×d÷dy.y^+d÷dz.z]
Explain flux density Dn ..integral countour .d×ds=integral tot D.ds .i +integral side.ds+integral button ..
Explain coaxial : rot =a and rot =b..cylinder ..
- explain capacitor determine capacitor ..C=Q÷V .. is the charge on the positivelt charge conductor v is potential rot .l=Q÷

V=-integral a to e = (p.^.rot.l÷2×1 14×€×sp)x(^rot dp) ..
CA=Q÷V=ROT×L×L÷(ROTL/2×1,14)ln(b/a)..
C'=2×1,14€×s÷ln(b÷a)
Capacitance of RG-59;a=0,292m
□□□□□□□□□□□□□□□□□□□

€=B×l×v..
If conductor does not move at rigth angle 90° to the magnetic field then. Angle tets added low lenz .....€=-B×.l.×v.×sin teta
-explain magnetic flux faraday low electromagnetic ..flux = B×A×cos field the magnetics flux ..tets angle between the magnetic field ..A the area of loop .B the magnet

On Thu, 28 Mar 2024, 16:17 tshingombe fiston, <tshingombefiston@gmail.com> wrote:
-1.Enquiry : qcto certificate accreditation
_____
-and assessments ocupation trade , n studies engineering electrical in trade trade test accrediation engineering electrical occupations ,scope nommination re -check rerwiten Qualification n diploma trade n1,n2n3,n4,n5,n6,n studie
-nated dhet: id
Panel control and wiring electrical level 1,2,3,engineering electrical infrastructure pratical
Id number: merseta ,chieta seta sasseta ceta
-1.1.Requirement:qualification qcto tools assessment and evaluation accreditaion trade and re accreditation trade test and scope n diploma engineering electrical

---
certificate and assessments occupation .
1.1 requirements:qualification trade n diploma award certificate 1th ,2th,3th,4th saqa qualification dr congo
Originator :Leaver assessment .diplome d 'etat technical industriel electrical ,
- pedagogie technique ; doplome attestation frequentation; prepo graduat electromechanic, electrotechnic ,electronic industrial
- inpp : service motorise
-unikin faculty science department math information
Technical industrial
- and certificate award 1th,2th,3th,4th
Qualification china
Id :
_____
Originator :St peace college africa institut police faculty engineering .saqa institu foreingn :frameworksqualification nqf policy cat ..research nlrd
dhet institution : policy dhet dbe policy examinationpaper sylabus .qcto from sabs ..
Originator :Scotiss ;
-sqa uk level 5,6 assessment evaluations reasoning ,india qualification level 5 practical institut ;
-usa qualification engineering std nema standard defense scope trade theory pratical lev ;
- canada trade occupation pratical license the trade license pratical trade test criterion

occupation assessment ;australia trade career
-French qualification : professionel.art metier ; technical engineering: bac laureat .en

-Belguim qualification : professionel art metier polytech cbec eic lausane
-dr congo qualification :esu epsp

_____

Purpose : applier science engineering,
 physic e assessments
-explanation criterion refraction V1 and V2 speed respective meduim lambda 1,lambda 2,wave length changing calculate :
Outcome :evidence low sin¤1÷sin¤2=n2÷n1=lamb1÷lamb2=V1÷V2:
refraction V1 and V2 speed respective meduim lamb 1,lamba 2,wave length .reflectiin internal lambda =200÷50=4,
Sin¤=1÷50.
-explanation:thermodynamics compressor fundamental isothermal process :is the temperatures is kept constant unchanged at the pressure increase during compression cooler process polytropic.
-explanation .compression process constant the work input the compress3 procedd foot found pound mass in genersl head .
Outcome : isotermal H isot = RT1LnR, R=100÷200×10 Ln100÷200.
-explanation compressible fluid adiab..integratic isothermal process explain state or true..equation PV= constat ; pv constat specifie volume ..
P÷eLogP base e+(V×V)÷2g+Z= constant
Low..
-Explain fugacity : is the change temperature consider isothermal solid liqyid or gaz .pressure and fugacity is converter gaz at very pressure isentropic
Integral uto u du =R×T integral .lnf to lnf .
Explanation math second order transition phase .P..V÷Vo..
-Define: specific heat at constst similar that constant volume .
-defined : as the rate of change of specificenthalpy at costsnt pressure with temperatures..cp =(dh÷d)T×p...14÷7=2..$Q÷dt ×p
The volume of cp obtained continues ..
-Statements constant temperature process constant temperature process are reffer isothermal true.
-explanation boiling and condensing process occure at constant tempera2 and are accompagny by a change phase the work fluide ..
Slow explansiin and compression process in equilibrium withconstant .
-isothermal procesd requirements heat or work transfer to or form the surrounding they are not adiabatic ..
-constsnt internal energy procesd du=0
- heat and transfer are equal and apposite so that SQ-Sw=0
- calxulating thermodynamic fundamental molar .idea gas obey ..PV=R.T,PV=const boyles low

isothermal expensionvolume .
W=integral .pdv] v1to v1,, RT ..v2÷v1
.- statement are trur ..An atom is the smallest unit of ordinary matter that form a chemical element
-explanation an illustration of the helium atom depicting nucleus pin and the electron cloud distribution black the nucleus upper rigth..
_heluim is reality spherofical symmetric closed resemble the electron cloud alth for more complicated nucleuse not ..
-the classification smallest recognized division of each chemical element ..
-the properties : mass range 1,67×10 exp -27 to 4,52×10×1 exp _25 electric chargr zero neutral or ion charge diameter range 62 pm (He) to 520 in data page .
- component electron and compact nucleus of protons and neutrons..
Statements sound and isothetmal .
- Velocity of sound process equation velocity of sound iso thermal process ..
Pv=m.R.T.....P=m.R.T÷T= 10×30×20×÷60=10..
-velocity of sound wave a fluid anf we above C=dp÷de. Sq root
.velocity isothermal procesd ...c=...velocity isothermal pro9cess
-state explain displacement nodr paint wave particle ..
Double antinode excited quartz ehance photo accoustic spectrophonr diffdring th

On Wed, 27 Mar 2024, 18:07 tshingombe fiston, <tshingombefiston@gmail.com> wrote:
Purposes:
-Vab=Vbc=Vca=VL, Ib=Ic=Ia.
Za=Zb=Zc=Zp=Zangle q.
-wa=Vab×Ia[cos(30'+q)]
Wc=Vab×Ic.[30°-q]
Wa+wc=Va.Ia[cos(30+q)]+VcbIx[cos(30°-q)]
-wa+wc=VL×.IL×(cos30°×cosq-sin3030.sinq)+(cos30°)×cosq+sin30°.sin
P3$='O'×3×V×I×(cosq)=°0°×3×V×I(sinq)=°O°×3×V×I×sinx
S3$=°o°×3×V×I..=P3.
Real power
P3$=°O°×3×V×I×(Cosq)=°O°×3×V×Ixfp
.Q3=O×3×V×I=×[P.3×$+Q××$]

-start delta loop a,c,d.
ZS+Zb=(zab)×(Zca+zbc)÷(zab)+(zca+zca+zbc)
-Za+zcc=(zca)×(zab+zbc)÷(zsc)+(zab+zca)

-Zb=Zab×zbc÷zab+zbc+za
Zab=zab+Zbc+zc×za÷zc.
Zb=Zab×zbc÷÷zab+zbc+zca
Zab=zab+zbzc+zcza÷zc..
Zbc=zazb+zb.zc+zc.za÷za..
□□□□□□□□□□□□□□□□□□◇^-

_____
Standard cabling interconcte point charge inductive resisitive 1+2j betwen l1 -Neutral ..2-1j betwen capacitive resistive l2 -l3..; 3 L1.L3, 2-1j L31 l1..3+3j..1+2j,3+3j l1.l4 inductive ..
¤¤¤¤¤¤[]□

_____
Star balanced connection parallele
Generator; connection start synchrone G1
Generator;connection delta synchrone line to line
30Kw@0,8 phasing back ;15kw 0,8 r
797 volt back phasor

-start a(64+16j),,(0,80+10j ohm

_____
1,4+1,6j ohm / 0,80+1,0j
G1 start g2 deltat ..30kw@0,8 baxk ..15kw line to line..if back = G2=(1500+1250).V2=546,3
V1=721.G1..(-30732-52352j)
Befor g2=(-15000-11250j), v2 = 6559..
G2=(-24452-22675j)

_____
Zb=Zb=Zc=Za@a° ..Ia+Ib+Ic..
Va=v@o
Vb=V@-120°
Vc=V@-240
Va=Vab=V@30°,
Vb=Vbc=V@-90°
Bc=Vca=v@-210..
VAn=V/°O°3@O°
VBn=v/°O°3@-120°
Van=V/°3@-240°
Connection delta va,vc,vb generation and z1 start charge diagram fresnel

_____
VAB=Va_vb
VBC=Vb-Vc
VCA=Vc-Va.
Connection va.vb.vc deltata to line z.z.z delta ..va = vab = v@ 30°

Vb=vbc=v@-90°
Vc=vc=v@-210°
IAB=VAB÷Zab=1@(30°-a)
IBc=VBC÷ZAB=1@(90°-a)
ICA=VCA÷ZCa=100(=
Ia=°O°3@-3@-30°IAB
Ib=°O°3

_____

Vab+Zs.Ib=vab+zs.Ia
Vbc+zs.ic=vbc+zsib
Vca+zsIa=vca+za

Kapp..
Increase decrease voltage..
V2..v20-v2=Rs.I2.cos$+xsI2.sin $..

_____
VZ1=VZ2=Vz3 simple valve ,Il,I=Z,I=V÷z
VL=VPH÷1,73
IA=Vl÷Z=(vph÷Z=(vph÷1,73)÷Z
IA=vph÷Z××1,73=vph ×1,73÷3×z
I.start =vl÷z=vph÷1,73/z=I start = vph÷z×1,73=vph×1,73÷3×z.
Power start = vph×i start ×1,73×cos @..
Power start=v.ph v.ph .×1,73×cos÷z×1,73
Pstar=vph×vph@cos$÷z

-delta conection z1,z2,z3,.L1,L2,L3.
J current reception. IL=IA;j=÷Z.j=I÷1,73..
J=vph÷z; j=IA÷1 ,73
Vph÷Z=1A÷1,73,,
IAZ=vph×1, 73
IA=vph×1,73÷z
Vph÷z=Ua÷1,73
Iaz=vph×1,73÷z
 Power delta =vph×Ia×1,73×cos$
P= v×(v×1,73÷z)×1,73×cos
P=3×vph×vph×cos÷z

Installation substation 70% max 70% ..
Worplace manufacture .ligthing .kw ;turninf non 10 hp comlressor ,pump incendie .15hp

after examiner customer ligthning turning 5 min pump ..factor factor interval of demNd x diversitt excecutuin 15 minute ×1,0.loading ligthning 5 kw ,factor of output demNd of .diversitt time of execution of 15 minute ×o,××+500watt×o,1=2,25 .5 min,current =15×1500w×o,1=2,25kw
5 min ×1,10=0,30
-load turn machinery =10cv×736×33=2,46
Compressor =20cv×7,36×5=7,46kw
Load charge demand =15cv×7,36×0,0=00kw

Purose:Qualification lab workshop practical
Engineering electricL power system :
Electrical workshop tools on precaution workshop pratical in discipline design equipment.
-Task la is concerne to design domestic explanation low:
Plug bulb fan motor
-assignment domestic load calculation .
Appliance unity power rating daily usage energy consumprion :fridge 100 400watt 16hour 400×16=6400wh;tv 27 unit 75 watt 12 h 75 x12 =900w;fan 36 unity 50 w 24 h 50 x24 =1200w;tube ligth 12.6 unity 35 watt full 12 h 35 ×12 =4200w;(:energy stove 9 unit ; 25 2h 2000×2=4000w
;(Motor pump 420 unit 2000wath 2..
Oven 480 unit ×3000w .2h ..3000×5=15000..) energy watt unit 30 month 1000kwh ..
《¤¤¤□□□□□□□□□■■□□□□□□□□□□■■■□□□□□□□□□□■■■■●●●●●●●○○○○●●●●●
-list of experiment topicd lab safety .electrical wiring; domestic load calculation and solar system design ;introduction to sketch .introduct 3 print .introduct to cnc machine process .pcb milling process introduction to solder2 processfinal..
- the chance or probaility experience hazard descript schoox physicologie can respira poor wiring
-Lab electrical wiring standard size of wiring 18Awto 1Aw..;
Gauge service entrance 3 /0,200Amp..1/0,,1/4 15 Amp
- sold bar copper wire: AwG 10to40;nominal diameter 2,6to 0,079 /0,005
●●●○○○○□○○○○
□□□□□□□□□■■■■■■■■■■□□□□□□■■■■■□□□□□□□□□□□□□□□□¤¤¤¤¤《《《
-assessments:wath gauge of wire used for 3/24(10AwG)
Power dissipation power= p=V×I ..p=235×10=2350w.
Provide brief conparison copper conductivity
Safety a workplace measurent instrument. : fundamental safety safe usage of lab equipment.
Tools : tester , voltmeter ammeter multimeter oscilloscoo signal generation dc power supply..
-Linear circuit lab
□□□□□□□□□□□□□□□□□□□□□□□□□■■■■■■♤■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■♤
□□□□□□□□□□□□

: Dc power supplies ;function generator .digital and analogi voltage and ammeter prototyping

-channels number of input signal acillocop :vertical ,horizontal base ,trigger of the oscilloscopes trigger level to stabilise ..
Assessments select device switable ..description ..device ..measure of time interval oscilloscop determine live neutral current consumer .measure of cPacitance wire ..
Used dc variable power to obtain 5 vdc obtain the output wave form on oscilloscope chanei ..use function generation to obtain 5 khz sin wave signal amplitude ..plat out vac of your oscullator calcuk measure
- rated 10 uf to 220 uf ; empirical 10.89 uf ..absolue 110-10,88 uf to 220-2299uf=99uf ..relative error FA-FM.VI/Fx×100%=8,9%
2200-2299÷2200×100%=4,5
Color code co-0-r-g code value 3,3kohm to 75 to 2000ohm to 820..empirical vLue 3,31 kto 76t929,230ti ..absolute error 117-76=1,1=200_2000=230..820-824=4ohm..relative..1 ohm1÷1×100%
-20,00-20239÷2000×10=1,15%
820-829÷820×100%=0,48

Letter experimental job experience: theoretical practical n diploma, employees learner n diplomat ,basic advance filing ,posted minim cadet junior senior principle trademarks

-1. requirement:
.letter experimental work based log activities theoretical practical school institutes employees learner , orientation practical school disciplinary didactic work based,

-1.1 explanation assessment
:trade claim inventory low
Triggered: gitlab,/ GitHub /azure

Issue test ..
-Triggered electronic elektor technologies
-Circuit microcontroller ,,
-Gitlab ,fail running
Issue kananga ,, Engineering tshingombe

Project ,committed contributing ,code source
...

36..Explanation: gitlab ,GitHub azure data ,work Running
-projects , pinned , issues,merge , request, contributors analytic ,
- repository analyse:
Manage,plan ,code , building, secure, deployed, operate , monitoring.
- measured in byte code exclude generated .
- percentage ,
,- coverage static for main mars 26-jun 24.. September
Bi Weet code covered.
Commit statict for main may 09-june 24.-august
-total 4 commit , average per day , authoritie.
Drag up date kananga5 .. overview commit pipeline., assignment, review milestone,time participate:

Issues...
Project code source ,
Marketing

Azure :,work item ,epic printed
Pipe line , ,test pipe
-measure in byte: project existing
Engineering tshingombe

_____
-github : tshingombe
Issue contribution,
Repository: run project code data source
Pipeline:
Repository:
-Dhet St peace college running projection:
Contribution GitHub collectivity;
__---
-38. pratical school: instituts research and development learner lecture vocational
- isita project back log dhet and DBE umalusi : pratical school trade experiemental workbased Teaching learning student assessor , student educator technical trade student trainer training student learner facilitator technical ,student : engineering businesses study,
Isita project subject engineering electrical : national examination learner topics examin:
Time table examination ,n3to n6 orientation industrial , plant operations,

electrotechnology ,electric trade theory conduct assessment
- project isita project total grand : experiemental theoretical and
practical,engineering ,orientation industrial trade theory ,orientation industrial plant operations, orientation industrial electrotechnology
-Project low examin rules ,in dhet in high school orientation assessment teaching workplace workshop technologie electrical , technologie construction,technologie ,grade 1to grade 12 technologie, Educational technologie circulum,grade 1,6teach pratical skill trade ,,9-12 teaching orientation technologie electrotechnology, organisation supervisor planing manager supervisor
Phase circulum,module conductor, insulation,matter ,AC ,DC current ,AC machine ,DC machine instrument, transmission rectified
-Teaching orientation industrial class: grade period basic workshop
Orientation .
-workplace experiemental relate: explanation , isita in dhet in DBE teaching workshop work class engineering vocational career Guidence

-Framework work qualification saqa:
Undertake material engineering ,
Teaching qualify n3subject isita project
Council trade, orientation industrial trade occupation trade isita workplace

manufacture city power power: technology trade electrotechnology letter topics CVS ,, in DBE teaching technical DBE orientation industrial Eskom ..city power
-organisation supervisor duty Eskom city
Power
Under printed learner assessment self assessment peer in dhet project.
 ,in dbe teaching grade circulum, orientation industrial
Eskom expo science : teaching teach grade electrotechnology orientation, electrotech industrial ,social project computer
Back log project skill fund ..
,- orientation industrial CDs ..close tendered
-lesson social worker practice
Marksheet student orientation industrial time table ,student organisations planing supervisor time table , student educare time time table , student Education,student Engineering studies time table, : student policing traffic , business, pratical office school student marksheet workplace experiemental learner close bid : close material trade theories in dhet in DBE isita ..umalusi

- DBE subject workshop grade to working CVS circulum study in trading isita
_____

- teaching and lecture Irregularite
Pratical
material candidate processing learn
Regulation back log after
Assessment center
-non attandance subject appear letter application letter workplace in dhet conduct learner project in dhet Afric instituts training shalom traing ,out mark term
Non attandance: subject non registered
Irregularite material: subject engineering science , mathematics,electrotechnical , industrial electronicien dhet in DBE ,ucpd
Record academic years .
-Total subject ,to back log project
Management system information learn , policy in DBE trade theory subject registration second additional subject
Rwiten subject : extra circular in dhet in DBE pratical regulation .
- practice police , orientation life teaching , literature mathematics ncv teach vocational guidance in DBE level 4 certificate pratical skilled panel control wiring electrical DBE workshop development: teaching workplace to trade in DBE panel ,,teach ucpd irregularity project back log printed

...

Introduction technologie,workshop electrotechnology , electrotechnic, electromechanical manufacture process
1.3purpose:
-planta d shop layout ,
-insustrial safety ,
-ferrous materials ,
-non ferrous materials.
-meeting furnaces
-properties and testing of metals
-heat treatment carpentery .
-patter. and core making
-foundry tools and equipment
-mold and core making .
-casting
-forgi g .
-hot working of metals .
- cold working ,

Sheet metal work,lathe machine drilling plane and sloping
-powder metalling .
- inspection quality
2.explanation :Manufacturing Engineering: process planing ,
Claim
2.1 process planing , 2 process sheets,
3 route sheet ,tooling , 5 cutting tools machine tools , traditional,numerical jogs and fixture ,7 jigs and mould ,manufacturing information generation , CNC port program ,10 robor programmers ,11 flexible manufacturing systems ,FM's group , integrated manufacturing cm.

-3. Explanation:Production process : process planing. Manufacture process , classification of manufacture row ,
-primary shopping process size casting melting .
-secondary machining process job understanding operational hot working processing forging rolling hot sprinning extrusion hot drawing.
4.explanation cold working process :
Cold forging cold rolling heading cold drawing wire stretch forming ,sheet metal working Piercy punching lancing notche. ,coming sequence ,deep drawing.
-5.explanatiin join process: reffiling assembly, welding platisc or fusion ,
-soldering reverting screwing welding plastic,press fitting sinter , bonding shrinking fitting ,explosive welding diffusion welding key and cotter ,coupling and nut and bolt joint .
- surface finishing process.
-6 explanation:honing lPpi g supper finishing belt grinding, polishing tumbling spraying ,pouring inorganic coatic analizing ,sherodizing parkerzi g galvanizing plastic ,metallic .
-7 product simplification and standardization: policy a counting procedure personal policies performance evaluation control of expenditure safety aspect security procedure regulation,design manufacture material and part supplies ,methods of testing drafting method abbreviations

-inspection and quality control ,size shape other dimensions involved measure.
-mechanization and autonomy
Control device increased productivity reduced cost of labour and dependence on labour short improve quality reduce in process inventory reduce dependence on operator in tease safety reduce risk humans fixed automation programmables automation flexible automation .
-fixed automation cam .
-Product system , manufacturing system .

Detailed design prototype development test simulation design manufacture.
- computer manufactt..-
- factory level production management planing , production management material Requirements planing .
- bill of materials capacity planning , inventory
- CIM technologt compl networks system design and analysis distribution process , modelling and simulation expert system quality engineering.
- CAD :soliD modelling variation computer .
-meeits of a good plant layout , reduce machine how workflow process inventory is , manufacture time relatively less floor area is required , material handling is less.
- explain types of layout ,fixed or position
-men tools component yes , workplace yes ,finished product to store

-explanation
S.No| line or product layout | process or function
Industrial safety ,safety precautions while working different hand tools .
Approved : screw drives wrenches ,hammers files chisel,saw tap

-engi seeing material yes = metallic material yes or no. Metallic yes ,
Metal yes ,feroos or non ferouse , steel plain carbon ,allot ,
Cast ion grey while react metalloid ductile,
- non ferrous , aluminium copperwood papperleather ,mineral cement class graphic,
-
-iron ore heanotite Fe304 colore red ,iron 70%,
-magneite (Fe203, colore blanc 72%
-lemo ite ,colore brown. 62%
siderite ,brow,48%
_____
_-explanation market forms of steel structure shapes : laball

_free cutting ,c=0,13max,MN=0,7-0,12,,S=0.16
-steel quality ,carbon tools steel Anees ,plain carbons ,

- Properties: application % tensile strength kg/mm.sq

-Typical blast furnace:

-Blow yes ,yes stove yes ,blast furnace yes ,slag ,oxygen yes ,mixer ,
.-basic oxygen produce yes carbon yes Stell ,bessirer convert bessure ,,

Basic open heart basic operation , acide open heart ,, electric furnace yes acid , pudding process wraug iron , acide crucible ,steel ,iron ,mealable ,steel , ,

_____

Tools

Plastic plaster ,5wax
- factor effecting selection of pattern material,
-number of casting to produce metal pattern are prefu required large in number ,type of mould process methods ,of molding hand or machine ,6 degree of dimensions accuracy surface finishing requirements minimum thickness requirements shapes complexity piece cost of pattern chances repeat order .

-types ofpatter :
-properties of moulding sand refactoring permeable cohesive green ,found sound casting test moisture content test clay chemical composition of sonde ground shape and surface texture of sound grand size distribution sans specific water absorption capacity permeability shatter index

---_____

Explanation: welding process ozyfuel gaz ,air acetylene welding oxyacet, oxyaceten ,oxy - hydrogen welding pressure ,

-arc welding process car on arc welding ,sheelded metal arc ,welding , submerged arc welding ,gas tungsten arc welding , resistance welding ,solids state ,welding process theemique radiant energy welding

-explanation: claim low
machine used in sheet metal shearing machine,bending machine, grooving machines peini g machine ,beading machine ,swaging , machine ,blurring machine,double seaming machine.
-types of press
-method of operations an born press .methods of power source Manuel press mechanical power hydraulic press ,
-fitting : explain introduction device equipment tools marking tools , measure device measure instruments, supporting tools holding tools striking tools , cutting tools ,tightening tools ..

-explain : inspection and quality control: checking components or product with requirements specification ,tolere Ce on port , interchangeable dimensions.
Size numerical value lengthimjte size :
.-uppee deviations algebraic difference between the two maximum limited of any size ,low deviations,mean fundamental deviations ,tolerance
-fits allowance fit difference hole size and shaft size allowance.
Fits yes clearence fit yes sliding fit yes or running fit yes ,,,
Interference fit yes or forcefit yes or strink yes press fit ..
-control chart : used quality industrial yes maintenance yes continuous yes evaluation yes , manufacture yes,
-statistical control yes ,device cast yes ,
-surface finish yes ,routines primary yes ,waviness profile ,lay,flow
-----_____

4.1requirement installation electrical guide ,, scheneider electric

-explanation : characteristics of particular source and load .

- photovoltaic installation ,
-residential premise and other special location .
-WMC guidelines measure.
-General rules of electrical installation statutory regulation ,0V to 1000V ,AC ,,0V to 1500, ln public network , compliance with national regulation ,IEC 603643,
-installes power load : characteristics values of cos .
I=IA.cos$/cos$.. power factor before compensation and cos alpha factor after compensation being the original.
- heating factor of 0,8 recommender number consumer ,5 story's apartment building with 25 consumer ,each having 6 kva installed .
- the total installed load the building is 36+24+30+36+24=150kva,
-thw apparent power supply required for building ,150×0,46=69Kv,
- magnitude of current in different sections of the main feeder supplying vertical rising ground ,level cross section area conventionally spece , 3 floor current entering the rising main at ground level ,
- 159×0,46×1000÷400×√3=100A
-(36+24)×0,63×1000÷400×√3=55A.
-Possibivilty of improving power factor ,extension to the installation installation constraint.
-In=Pa×1000÷U×√3,
Pa=KVa ,rating the transformer.
I=phase -to phase voltage at no load in volts (237V or 410V) in ampers ,
In =Pa×1000÷V=,
V= voltage between LV terminal,

Simplified equation for 400v(3phaae load ,) In = kva×1,4 (IEC 60000 power ,
-explain choice and use MV equipment ,MV / Lv transfo for use of MV , equipment choice of MV /LV ventit in MV substation,
- substation including generator and parallel operator of transformer.
Generator alone operation not working in parallel with the supply network.
Generator in parallel utility supply parallel operation of transformer ,
- type and constitution MV/diatrt,
-differenr type of substation,indoor substation ,outdoor substation.

I'd=Uo÷ZS,,0,8.Uo÷ZC..
I'd=fault current ,
Uo=nomminal phase .
ZS=earth fault current ,
ZC=fault .

_____.

5.Scotland qualifications
Explanation

-basic software engineering concept to solving electrical and electronics engineering problem.
-writing and testing and documenting I/O.
- Program using the basic structure
-deaign using flow charts or program design language.
-Write test and documents linear programming using I/O statement.
- Write test and documents I/O Programmation incorporating subroutines .
-table Boolean expression for logic gate knowledge skil .
-hexadecimal number system.
-conversion , between hexadecimal and binary gate symbols.
-teith table associated Boolean,and /or/not ,exor/and and nor .
-combibation logic , expression in sum of products.produxt minimise logic ,draw minimised digital,
-sequencw logic .
-bloc diagram of sequential machine need for memory in sequential machine need memory in sequential logic latch ,JJ and D bistable elements.
-asynchronous and synchronisation operation counter and shift register circuit using bistable .

-lofic family device characteristics.
Circuit .

Build and test counter and shift register circuit
- evidence requirements should

-single line schematic for 33/11kv substation,
-liar standard fault level for local
Sister voltage (250MVA at 11KV ,100MVA at 33 KV,
-pee unit calcul : concept of infinite busbar by grid system working with ,3phaae short circuit by grid system working with 3 phase short circuit worst case scenario calculate fault level for a fault on an ,11kv feeder fault level , fault 11kv feeder from a busbar it is expected that the circuit used will smillar to infinite system feeding 33 KV line with inductive reactance and transform per line excepted one generator should be

connected to the ,11kv ,,
.S1=250MVA,,U1=11kv,,Z=√R.R.+z(w)..
V÷I=11÷39,3=0,279,,ohm ,,,
=100÷5,24=19,083 ohm ..
S,=V.I.√3..
I2=250÷11×3=22,72KA,,,,39,3KA
I1=100÷33×√3=3,039==5,24KA..

-explain next generation higher national electrical engineering : utilisation electrical power transmission lines and complex waves,
-Porformence calculation to determine each Zo ,V ,B ..
- Voltage current and power for one fill ZL>Zo,,,ZL<Zo
-calculating phasor complex waves calculating electrical quantitie R-L-C..
-computung in engineering programmablw system unit ,micro controller system or a standard personal computer with access I/o

- the requirements earth fault loop impedance Zs ,in relation to the electric shock constraint of a circuit [ZS=Zo+(R1+R2)]
-develoment speedload and torque load graphs for basic motor types using DC ,,
E=V-Ia.R,,,,,E=K1.N.flux ,,,

<u>6.Engineering mathematics</u>
<u>,course code ,</u>

Valise.

-knowledge and procedure function bit
-input port switch analogy output ,port motor led , digital analigi converter platform personal computer development personal computer development micro control ,
- explain software system partitioning into manageable task structure chart
input ,process ,output modulator programming step wise detail design lineare creating and saving file compiling and debugging source code syntax error executinf the compiler code ,
- executing the compile code .run
- repeat
Action to be performed until a condition holds .
- while conduction to be tested Di action to be .
-ens while
- write test and do ument I/O prog using conditional selection>>
-ID conditions then action ifco dition gold's .
-ID conditions then action if condition holds
-else
Action if condition does hold.
-End if
Case condition of
Case 1:action for case 1
Case 2:action 3 for case2
Case n : action for case 2 n
End case
Condition based input portion use of build process such
- write .
-test condition documents
I/O prog using iterative loop statement.
-repetition
For variable ,from start to finish in steps of value .
Do.
-sections to be repeatlt perform
End for .
-fundamental of control system and transducer .
-high level Engineering software.
-soffward engineering process creating file editing files process constant and variable.
-operatoe and
-statement :input output documents.

- evidence requirements , satisfactory write one linear prog.
- input and output statement different type of variables arithmetic operator .
- knowledge skill test and documents.
Relation operator =,|=>logical operators
-vooleen express.
-branxh statement
,if then if ,. Then,,else,,case,,of,,port configuration readings.

-outcome 3 :
Flowchart pseudo code : for ,do,repeat, until,while,loop.
-statement:for do repeat , until while .
-looo to manipulable data array
-out put array , data array read port data into .
-testing of iterative loops ,test plan and actual .
- if then ,else
If of either while do or repeat until for next

to

- Advanced unit specifications: engineering mathematics 1, qualifications Scotland,level6
-outcome outcome provide evidence following skills skill time .
-solved 2 problem on degree radian .
-A.sin(nx+-a)=, or ACOs (nx+a)=b
-blow , logarithmic
 -log+logy=logx.y
---logx-logy=logx÷y
p.logx =logxP.
y=A×lnx
y=A×log x..base10
Convert rad =Teta ÷180×π
- A×sin(nx+a)=+-B
- A ×cos (nx+alpha=+-B
-y=a.expx

- explain ,,x =log .base a inverrse function .y =a.exp x
y=10 .exp x
y=e.exo x ,,x = log .
y=e.expx and ..x.exo =log..e y

- solve exponential (5 .exp , = 95 ,,,x exo 3.5 =0,1..
log .base 10 (x+2)+log .base (x+4)=0,5
..
-Apply mathematics technique to vector and complex numbers ,2 d
d=√(x2-x1)(x2-x1)+(y2-y1)(y2-y1)

-D:,,d=√(x2-x1)(x2-x1)(x2-x1)+(y2-y1)(y2-y2)(y1-y2)+(z1-z1)

-scalar ,,ab = b.a ,,,a(b+c)=a.b+AC

-b.b-4a.c<

- cos(x+B)
Sin.a ×sina+cos.cos alpha =1
-sin2a=2sin alpha.xos alpha
-cos 2 alpha = cos .cos alpha -sin

- driver , differential , hyperbolic

a.x exo (ax+b).exo n ,,,ln (ax+b),,,e..expon (ax+b)
-sin (180 degree +Teta) = sin .Teta
Sin Teta + cos = 1 , sin 2 a alpha
1-2 sin .sin a ,,,cos 2 a ,alpha = cos .cos a - sin 2.alph

-_____
Hyperbolic identify
e.exox = cos hx + sin .h.z
e. - x = cos h x - sin h x
Cos h.x 2x-sin x =1..
- sin h (x+-y) = sin hx .cos by +- coshx sin y
-cish (x+-y)=cosh.z coshy+- sin h x sin h.y
-sin 2x = 2sin h.x .cos hx
-cish 2x = cosh.x+ sin h .sinh x.

_____

Integral .u (dv/dx).dx=uv-.. integral.v(du/dx).dx

Equation:
Integral .x.x.e.e. dx

Integral 3 limited ,x dx ..
Integral ..b..a √1+(Dy)(Dy)÷dx()...dx

_____
Introducing ,j in term ...j.j =-1,,j=√-1
Introduction Euler relation
e..exo j Teta = cos .Teta+j.sin Teta ..and Z=r(cos.teta -jsin.teta) r .e.-j.teta
For ,-10,(-2+j5),(1-j)(1+3j)..that Z1 ,Z1=6,e .j π/6,,and z2=9e..-jπ/3..
-Det,Z1.Z2..and Z1/Z2..
-introduced moivre theorem (cos .Teta +j sin Teta) .n = cos Teta..Z.exo = r ..
-solved involve express (√2+j)5....
-solved ,Z.....
---_____
-diffentiatiin technic to solve engineering problem.
a.x .exo ,(ax+b).exo..n

-dy/dx=Dy/du,xdu/dx

-apply chain module to function..
(3.x.exp4+7).exo,,sin(t.t.t+1),,5

_____
Use differentiation technique to solve .
y(x)=u(x).v(x)...state product quotation..
Dy/dx=V×du/dx+u.dv/dx..or y'=v.u'+uv'

y(x)=u.(x)÷v(x)

-dy÷dx=v×du/dx-u×dv/dx÷v.v..
-Vu'-uv'/v.c

-solved ..x.x,,sin
(4x+9).e.-3x,, t.t-1/t.t+1,,..

Solve differential
x.x+3(y)(y)+4x-5y=, linear factor quadrature improper.
.-solved infinite integration ..
Integration.(5x+2).exp6 dx,,
Integral (x)√1-x.z..dx..

-solved second order constant linear differential.
a×d.d.y/d.x.x+Dy/dx+cy=f(x)..
Use partial differential

f(x,y)...z=f(x,y)

, explain that double integration involve integration,f(x,y)

Integration.integration .r..f(x,y)dy.dx..
Region integration x-y,,

-solved differential equations Laplace transform introduction la place transfo ,f(t)
F(s)=integration ,e St ..f(t)DT..

,,ergent value vector solve linear ,
|[A-lambda],, matrices ,,,x of eq Ax =lambda x..
-problem manipulation of matrices ,sq, identified transpose argument..

- solve problem use of Serie representative Taylor Serie .
f(x)=f(xo)+(x-xo)f'(xo)+(x-xo)exp2,f'(xo)/2+(x-xo)exp n,f(n).(Xo)/n|

introduce mac Laurence .
f(x)=f(0)+xf'(0)+x.x.f''(0)/2|+...(x.n.f(n).0/n..

,eg ..e.x ln (1+x),,,e.x tanx..

Deviations a linear approximation,polynoy..

-solved first differential equations..
Dy/dx=f(x)g(y)..
-y=Vx,,or y=ax+by+c

Dy/dx+P!x).y=q(x)..

-voltage flow
A 1=RF/R1,,Av2=RF/R2,,AVN = Rd..
Vo=(Av1.V1)+(Av2.v2)+...
Vo=RF(V1/R1+V2/R2+....

Amplifier

AV=Vo/(V2-V1),,AV=RF/R1,,Vo=RF/RI(V2-V1)

--id V1<ref then Vo satire positive,
.AV=Vo/V1,,,AC=1+RF/R1,,
Vo=(1+RF/R1)..

-typical amplifier circuit
Vo=out voltage
RF=feedback reinst
Vi= input voltage
Ri= input resistance
VCC= supply voltat ,AV ,supply voltage

, explanation ,bit polar transistor story ,hfe = IC / io
MOSFET transconductance ,,,JM= Aid /A.vg

ID=vDD/RDs,,.V=IR
Et=R1+R2+R3
1/Et=1/R1+1/R2+1/R3
Et=R1.R2/R1+R2....
V1/V2=R1/R2....
V1=V1.R1/R2...

Electrical energy ,EC= V.t..
Work done ,Ew=F.×d,,
Power ,,O=E/t
Electrical power ,P= V.T ,= V.V/E=>...I..

_____

6.<u>Engineering science.</u>

<u>Structure</u> :

Stress =£=F/A,,,,strain €=ΔL/L

Young module ,E=¢/€,,

Factor of safety = ultimate load / safety working load..

----------:

Pneumatic: pressure force area ,P=F/A,,area circle ,A=π.r.r ,,,A=π.d.d/4,,=. π=3,14,,

-mecanisme :

Velocity rotation,

VR=spped of input /speed of output,,

Torque ,T=F.r

Circular of circle ,C=π.d

Moment of force ,M=f×l

Prince moment ,sum =0,, condition..

<u>-7. explanation engineering science</u>

<u>Explanation:</u>

:variable temperature soldering iron is shown the soldering iron use a two state control system to turn heating element on and off,and to monitor it output to maintain the desired temperature.

- completed the control diagram for the soldering.

-desited temperature>>>, control unite ,>>, temperature sensor,>>>soldering iron temperature,

-viewi g platform..

-explanation: A beam used in the construction of the viewing platform.

Calculate the magnitude of the reaction at B , calculate magnitude and direction of the reaction,

- calculate the magnitude of reaction at B ,,

Labalked ,

(24000×1.10m)-(3500×0,30)

(F1×L)+(F2×L2)=
264000+10500=35000×L
265050÷35000=75,70m/n

8.Explanation: A lifting system to allow worker on construction to carry out essential maintenance is being .

A warning system that will ,sound an alarm when the platform in motion is two button used to control the upward and downward motion ..

-input /output. | Operation
-alarm sound | A=0
-Maximum load. | B=1
-bouton c
Pressed,
Bouton depressed| C=1,,,D=1..
.-propose design has the following specifications condition must be met the alarm z ,will not sound unless the gate (A) is closed will not sound when weight on platform will sound when either button ,c or complete the Boolean equation for the alarm ..

Explanation: calculate a suitable value for RF:

Vi=RF/R1(V2-V1),,,
Vin =(Vin+Vin+Vin,

O,31+0,53+0,47=1,32
RT=1/33000+1/3099+1/30000=o,ooooo90960
RF=,,RF=Vo×R1/V2-V1=,
1,2×0,09999096/1,32=0,0099910

Explanation mechanical engineering must design a pneumatic circuit meet the flow,when push button VA and VB not pressed ,or when. Not pressed lever ,VC state double acting cycling must, outstrok {A`.B.`+C
-a short time after cylinder outstrok must instroke automatically an initial design the circuit...

The program to control the cylinder must follow criteria oustroke =A`.B`+C the cylinder must remain oustroke 15000 milrsecond ,209 milrsecond after the command to instroke the system start monitoring.

Explanation
-An alternative motor with moseft driver in also consider the mosef has a resistance of 2,3ohm fully Saturated and the motor is rated as 0,49 w at 6.0

I=0,40÷6,0=0,07
I=V/R=6,9/2,6=2,60,,
E=V-IR
6-0,182=5,818V

As part of the car control window are to be open and automatically the following control produced ,by

- explain with ref to the circuit above the impact switching out 7 high then output 6 high then output 6 high has on the motor

---
Program below in Pbasic ardwno code is know to have fault..
- main if pin 3=I then jump
If pin 2=I then main
If pin 1=0then man
Jump:high 7
Pause 15000
High 6
Pause200
Low6
Goto jump
-void loop (){if digital read (3)== high {jump();}
else if (digital read 2,
==High){loop ();}
else if (digital read
(1)==Low){

loop();}
Void jump (){
Digital write (7,H,G,
Delay (15000)
Digital write (6,high delay (2000); digital write}
-

The camera is placed on the outside car and a talk of clear plastic is place ...

Ligth sensor is used to identify when the plastic is dirty when it sense a value of less than 219 lux a motor spins to move clean plastic In front of the camera the control ,
- calculate the value of aR1 required to saturated the op - Amp positive 219 lux ,
R1=Rcc-R ,,,Vo=(1+RF/R1).v

-motir requirements ,55mA of current ti operate the op - amp saturated to 78% of the supply voltage vbe is ,0,70V saturated transistor
RF =,,,explan 9,0055A÷0,70÷0,000795÷6÷9,,

R1=Rf÷vo÷v2-v1, = 0,01119...

Truck ligth system ,completed logic

A,B,C,D,E,F,

---+
Batteries power portable flood light are to be installed the construction site to allow work to be completed in lower ligth ,the battery is rated at 15V,13A,kB hour useful energy is 2,32 MJ Completed the energy audit diagram for the portable floodlight batteries slowing the input and output energy ..

The diagram below show part of the design for the framework that supports the floodlight.
.-calculating using nodal analysis at node A,and B the natural force in ,AB,AE,BD,and BC

Member | magnitude. | Natural
AB. |. |tie

AE. |. | Strut
BD. |
BC

. explanation= L=355×cos 30=321,73nm
AE=455×sin39=227,5Nm
BE=455×cos 30=227,5
DA=(455×30 sin ×30 sin)+(350,sin 39
=321,73+227,=549,29

The force w represent the weight exhibition and is acting ,1,4 m from point B ,the distance from A to B is 3,46m
Draw a free body diagram of the force acting on the exhibition calculate the force ,
650×sin 120°
776×sub 120°
-force acting on the connecting ring
Q=(530×cos65°)=223,97
P=650×cos 37°=447,2
T=776×cos48=539,054
F1+f2+f3=

---
d) replacement exhibition is to suspend from ceiling some positions two cable support the new exhibit hanging from the connecting ring are replaced Hallow aluminium..
The 2.7 long tube has a diameter of 72 mm an walk thickness ,,2,5 mm it support a load of 32,7 N calcul the charge in length tube it is load new exhibith .

A= π.d.d÷4= 3,14×72÷4...
€°2,6-2,5÷2,7=1,92..
£=F/A=32,7÷56,62=0,62..

Engineering civil compact , calcul the total torque produce by motor ,

- described an advantage : described the purpose of.

-funal design structure used to support the weight the boring .
Completed using nodal analyse table of the missing force their nature of the missing force their nature .

Member .| AB | AC| BC| BD| CD
Force |. |. | 583kn|566kn|

Nature | tie | strut | strut |

AB=(550×61)+(550×61(

---------++------
Calcul the force that player strikes the ball product a torque of 295 NM
(0,34×295)+(0,84×295)
Force extension graph ropes

Calcul the strain energy in the rope when it experience tensile tension 159 ..

----------__----_
An electronic engineering design digital logic circuit for Boolean equation ,
Z=(A`.B`)+(C.D)
- draw the digital circuit for the ..

Design for an operation amplitude op circuit is

Calcul gain for circuit when V input voltage is ,9,11V ,,ΔV=7,59÷0,11=69..
Determine appropriate resistor value for E 1,and RF : AV - R1/E1=59-1/R..

Integrator
§vout =1/RC.integrator .Vin St ...

f=1/2πRc..

555,timer stable ..

Marj = T1=0,7(R1+R2)
T2=9,7 R2.c
Freq° 1.44/R1+2R2c..

Calculate t output voltage of the difference amplifier amplifier when the ligth ,calculate the

minimum output voltage requirements from Amol to cause three ,
d) described effect adjusting variable resistor will have light level ..
- the LEDs ,are at their most offence when current of 52 mA ,flow each they also found 2,3 y occurrence ,
Calculate the required resistance for protection resistor ensure maximum efficiency ,VCC for the comparator is set to 8.0 v the comparator saturate at 75%
.I'd = 52 mA ,,vs = 23v ,,,
ID,= 9,0952÷8=0,93,,
23/0,04=575 ohm

Future solution involving used of microcontroller is also tested an output pin on the microcontroller activate bank of LEDs ..

From sensor input ,microcontrol yes ,,pin 6 ,,

1/R1-RD)+(1/R2+rd2)+(1/R3+Rd3)+(1/R4+Rd4..

Explain with ref ,to code circut the effect on the LEDs ,when the reading from the analogue sensor rises from,5 to 200

The logic circuit show below control valve that provides water for the plants ..

Explanation pneumatic circuit need to feed wast into incidence part of a system to produce electricity safety reasons ,be bar material is pushed in the system cylinder outstrokes allows .
. càlcul the minimum base current in requirements to switch on the relay ,,,,

In =0,7/1,5=0,4667A..

.- calculate the voltage requirements across the resistor assuming vbe is ,07 v ,,calculate the current through the variable resistor ,
V=6.0.1,5/2,5

- by using pulse width modulation the LEDs can be mode appear bright or dim
Code for the test is below in Pbasic and ardruuno

```
Main:                 into sensor =A9
redax Pino,Bo.    Int led bank =7
If Bo<50 then level 1.  Void set up (){
If Bo<100 then level  pin mode led bank                                    output
If Bo <150 the level 3
Let mark=0.             Void loop(){
Let space = 10.      Int reading = analif reas sensor
Goto pulser.           Int value° Mao ( reading ,0,1022.  ,0255
                      If value
Level 1:
Let mark = 19. Delay (10)
Let mark = 10  . Digital write ( Les bark ,low)
Goto pulser.  Delay
Lev :  ..if ( value >49 value <100){
Let space =4 ,delay (6)
Goto pulser ,  digital write ( Les bank ,low delay

- level
Let mark =3.       If ( value > 99 et value < 150
Let space =7.      Digital write ( Les bank high delay (3) . Digital
Pulser
High 7
Pause mark ,pause ,space ,, digital write Les bank ,high delay ,
Goto main ,. digital write Les bank ,low delay (10).
```

<u>, 9.experience nated:</u>
<u>Explanation mathematics</u>:

Z=-5x.x.x.y.y-y.y.y.y+3x.x.y

Deriv partial/derive partial(driver partial/driver partial)=
Derive /derivate partial .x(-10x.x.x.y-4y.y.y+3.x.=-30.x.x.y+6x

Explanation:
I=V/R,,
I=V.R.
ΔI=derivation .I/derivation.V×ΔV+derived.I/derivation.R×ΔR-VR.VR.-2.ΔR.
=1/R.ΔV.-V/R.R-V/R.R×ΔR.
=1/100(5)-30/10×10(-8)=1,9A

-explanation :
y=integration × sin .sin.sin.sin 5x.×cos.cos5dx.

=1/25.sin.sin.sin sin sin 5x-1/35.sinsin.sin sin sin 5x+c

-y=integration ,sin .sin.sin.sin.×5xcos.cos.cos5xdx..

-y= integration.1/√16x-x.x.=dx
=64-(x-8)

y=.sin sin .sin.sin .,mx dx

=1/4x-sin2mx/4m+x/8+sun4mx/32+c

y= integration..e.x/2 cos 3x dx

.=0,324e..x/2..sin3x+0,0054.e..x/2..cos .3x+c..

-integrale . -x.x +3x+4/x(1-2x)(1-2x)..dx

-integrale...10x.x+7x+1/(2x.x+1)+4x-1)..

-d.d.y/dx -7dy/dx+6y=2x+3.

-y: m.m-7m+6=0
m=6,,m=1.
YC=A.e...6x

-dy/dx...
d.d.y/dx=0
0-7c+6cx+6D=2x+3.

-Question :
3/x = -x+4
x.x -4x+3=6
(x-3)(x-1)=0..

Δ.vy=2πx×(y2-y1)xΔ

=2,667π units ,,8/3.π units
Δvx=π.y.y×Δx..
Vx=π integration.y.y dx
=0,685π unit

Δ.My=π.y.y Δx..

X=1,798/2,152=0,836

2x.x=3x
x(2x-3)

Δy=(y2-y1).Δx
=0,542..

ΔIy=(y2-y1).Δx.x
=0,316 unit

y-y1/x-x1=y2-y1/x2-x1

Rac1=0,1+0,25=0,35ohm

Cos $=P/VRM×IRMS

Nmax=k.s cos $/k.s.cos.$+2p×100%

-K=√Po/PSC..

I1=S/V1..
Z1=ZA×ZB/ZA+ZR

Energy=P.t

Pu/u regut=I2(Re1cosx+X.sin $/vs)

EP=3300/√3.
f=NP/60
KP=cos alpha /2=cos 30°/2=0,966
EP=4.f.flux.Tp.kp.kd

I=ER/z

Pi=√3.vl.il.cos

%,s=ns-n/ns×100%=5%
-powder developed = rotor output 28kw
Rotor copper loss= rotor outputted (s/1-s)
=28(0,05/1-0,05)=1,474kw

-powder input rotor output+rotor copper loss +rotor +total sector loss
(28)(1,474)+(0)+(1,08)=30,554kw

Pi=√3×vl×iL×cos
IL=30,554×100/√3)(525)(0,8)=42A

-powder output = rotor output frictional loss = 28-0,8=27,2kw
efficiency=Po/P1×100%=89,023%
-from triangle A,B,C

tan (41,41°)=BC/750
BC=661,447kva
From triangle ABD,,tan (25,842°)=BD/750.
BD=363,243 Kvi ,,
Installation KVa ,= BC -BD==298,204Kvar
Cost of capacitor
Bank = (298,203)(295)=87970

-kva charge before installation of capact bank =(1000)(132)=R232.000
KVa after installing.
AD=√750+363,243.=833,334kva
KVa charge after installation of capacitor bank =(833,334)(232)=R110000
-monthly savings in KVa charge
R132000-R110000=R22000
Number of months =87,970/22,00=4

10. Explanation, installation

10.1 Rules : scope :

-normative reference :
-definition , abbreviations
-term
-compliance
- application standard,
- marking of equipment
- embedded generator
-Protective equipment:
-characteristic ,
-installation requirements
-Generator :
Generator circuit arrangement
- interface point requirements:
-integrated system requirements:
- electrical energy storage system asynchronous inverted ,based generation.
-asynchronous machine verification testing general inspection ,planned
- testing earthing ,bonding specific , embedded
- recommended labell close ,Laball denoting ,main AC isolation

- EIC sans
| System size(kW)| minimum

-|PV Modules|design qualifications| IEC
Ammonium. |test module|IEC ,61115-1-2
Salt mist. |. |

Safety salt. |
PV connector|
RCM

-inspection requirements
_____
-component. | Requirements
Section | check verification
- DC syst gene|
_____
-test report low voltage embedded installation

- warning equipment part of embede generation.
Main switch ,Labe sans 10142-1 clause
Photovoltaic systems

-Pv module ,2 DC strings ,2 DC combiner box ,DC disconnector,5 surge protector DC to AC invented ,AC disconnector ,solar load controllee , seg ,Sister,10)rcd type B if not galvanicallt isolated , options , utility safety switch main distribution , utilisation box
_____

- PV modules| total nominal | total| total

Install yes no | string array|nominal nom
PV modules|
Configurati|
-module
Technology|
_____
Inspection and test
Note | existing|new ,altered
-circuit fuse. |
-switxh
terminal ,DB |
Marked label
-anti closed. |

Death protect test |
Synchronous
Max gas calcul|
Voltage cell A |,

- Supply side measure application

11. Scheneider: guidelines

-

Generation |distribution| consumer
transmission|substation| consumer
-power
Plant
Generalised| substation| industry infrast

-photovoltaic installation monitoring .
Requirements for self consumption ,case of self consumption.

- utility seal power plants ,500kwp , upward ,
-system based on a SCADA , supervisor control and data acquisition DC / AC ..

.

-protection LV generator set and the down stream
Generator set parallel connection.
Parallel operation ...

- if sum of the motor power is high simultaneously Starr up of load generate high pick - up current that damaging a large voltai drop due high value non starting of rotor temperature prolonged starting .

-tripping thermal protection.
A Generator characters Sn =130 KvA at a power factor ,,0,8 UN = 500V ,,

XD=20%,,is =750 ,if the sun P motor is 45 kW (45%generator power sum calculating voltage at start up ..
Sum power = 45ka ,I'm = 81,,hence starring current ,I'd = 480 for ,2 to a 20 s , Voltage drop in the busbar simultaneously motor starting

Δu÷u=(id-in÷isc-in)×10..in % { 55%
- Δ U=55, which is not tolerable for motor faillure if the sum Of motor is 29kw(20% generator power ,
Calculation sum P motor =20kw,,I'm = 35A ,hence a starting current I'd = 210 A, for 2 to 20s voltage drop on the button,,
ΔU/U=Id-in/isc-in)100
.

11. Nated :
industrial electronics explanation.

- transient calculate the value of highest resistance required to allied oscillation to place .
Let ,1/LC=R.R/4L.L:..
=√4(32,25×10.exo -3/22,75×10.exp 6 = 75,302
-fn =1/2π×√1/Lc-R.R/4.L.L

=1/2π×√1/32,25×10-exp-3 (22,75×10. Exp 32.

=(0,1592)×(104,383)=16,6hz
-step calcul Vi (max) .
C.max = Vi(max)÷V/C
Vi(max)=555×1,55×10,exp /10
RF= Vo×RM÷RM×Rf=RM+RF(Vi)=Vo×Rm..
RM|(Vo÷V1)-1
=1,55×10.exo -3 |1,55×10.exp -3..
-task --->design concepts --->computer>>>display..
Use , existing design,use existing formula,modify , generator

- Vmean at 0°=√2/2π×VRM×(1+cos alpha)
√2/2π×240(1+cos 1)=108,038v
Meant at 90°=√2/2π×VRM×(1+cos alpha)
=√2/2π+240(1+cos90)=54,019v
- Vmax=√2×Vrm
=√2×240=339,411V
IRMs=√2/2×irmax = 10,60..

P2=√P1.P2
=√104x×800
V1=Vr1/N=0,4×60/550=0,0436mm.
m=P1.P2= 104×0,04364=0,05416kg
V2=m.R.T2=0,05416×0,287×292=0,01574m
P2,288,44

Vs =v2=π(D2)/4.D=0,01574=π(D2)./4
P=2.n/n-1.P1.V1.[(P2/P1).exp .n-1/n -1]
=95,69kw
- prerequisite= pact /n = 95,69/0,88=108,74kw

-at ,44,8°c ,,h1=188kj/kg
at 93,5°c, H2=392kj/kg
At 1500kpa , 350 °,,
H4=3148kh /kg ..
h plant = ms (h4-h1)/mf×hv. ×100/1
=5400(3148-188)/600×3200×100/1=83,25%

EE=ms (h4-h1)/mf×2257
=5400(3148-188)/600×2257=11,803kg,steam /kg fuel
Qecon = ms (h2-h1)/mf
5400(392-188)/600=1836kj/kg

At,1500 kpa ,hf = 846kj/kg and ,hfg = 1946kj/kg
= 2595,5kj/kg

Q,super = ms (h4-h3)/mf
5400(3148-2595,5)/600=4972,5kg/
Q,flag=m×.cp.×Δt
(15+1)x,1,045(210-24)=3109,92kj/KJ

Qin (KJ/kg)	out KJ /kg	%
Qfuel=. 32000.	Qecon=1836.	5,74
	Q Eva=19831,55.	61,97
	Super. = 4972,5.	15,54
	Qflugas. =3109,9	9,72
	Unaccount= 255	7,03
320.	3200.	100

~=C.p/CV=1/0,712=1,4
T2=T1(V1/V2). exp ,alpha -1 = 28(13/1) ,exp ,1,4-1 = 806,26k
T2=P1(V1/V2)=10,325(13/1),exp = 3674,83kpa.
T3=T2.P3/P2=806,26×5000/3674,83=1097k.
Q2-3=2/3.QT
Q3-4=1/3QT.
(2/3).m.c.v(T3-T2)=(1/3).m.c.p(t4-t3)
3×0,712(1097-806,26)=1(t4-1097)
T4=1511,01
V4=T4.V3/T1=1,3774m
T5=T4(V4/V5).alpha -1

ASR=1-Ts-T1/(T3-T2)+aplh(T4-T3)×100%=62,47%

- explanation cpd, continue professional development ,
Scotland outcom qualifications,UK qualifications:
-13. research on papper libry text book
Bibliotech:
Reference:resource
-uk magazine for electronics technology and computer projects .
EPE , everyday pratical electronics

Order book ,8$,,10$,,3euro ,200rans
-Projects and circuit,series features, regular and services
-Topics : Scotland magazine second voice recorded module: record two ,four eigth different message clean and clutch free line level audio output can feed an amplifier or PA system ,8 bit recording quality user selected bandwidth..

- Scotland:Applied skill engineering electric , Engineering electronic engineering science , mathematics engineering

-Topics : scottland outcom
PIR - triggered mains switch ,use a domestic pie system to switch any mains -power device ratesup to 10A..
-topics : multti function , intelligent remote , controlles dinner the ultimate dimmer project using a standard handheldsr remote ..

-topics teach in 2011 part :logic circuits - our to be missed introduction to gates and flip flops.. Microchips microsti k development board..
-10.constructional project:
Design concepts: Hk828 module record 40,60
-getting the messat : module jump random sequence.
- how it works: function heart module architecture
-labelle the block diagram of the hk828 voice recorder chip while the recording process relies on audio sampling the audio is not stored digital but used and analoguw sample and hold system the analogue sample stored sample ..
-samplung rate : capacity array means that HK store total ,8000samplw per second total ,262,144/8000,,42000 sample ,4200 total ,262,@44/42000, recording bandwidth fidelity propertionaj sample ,2khz , samples ,just 4khz..

-circuit details , 4,7 if ,,and 220kohn ,19pin preamp and AGC,, circuit vis couple 29,,5,8hz,,47kohn , switch logic signaj teeminaj .

-parts list multi message voice :
1,PC board code 797 available Epe pcb service 110mm×57mm.
1).electre microphone insert .
3) ,3 way terminal blocks PC mounting
1), 2way terminal block PC mounting
3), 2 2- pin section of Sik header strip.
3 jumper shunt
1 ,)28-pin Dik ,ic socket :15,24mm spacing.
1)8-pin Dik ic socket ,7,62mm spacing

1)2.5mm concentric DC power plug ,PC mounty socket ,PC mounting

_semiconductors :.1 HK828 voice recorder IC (ic1)
1)LM358 dual op amps (IC2)
1)78L05. +5regulator ,reg1
1) PN2099,PnP transistor Q1.
1) 5mm green led (led1)
1)5mm res Les (led2)
1)1 N4004,1A diode ,D1
-capacitors :
1) 2200uf , 16V, radial wlectr.
1)220uf, 16V radial elect
1)22uf,16 v radial electric
1)10uf,16v
1)4,7 if tag tantalum
1)220nf ,100v MKT metallised polyester.
1)100 nf ,multiyar ,monolithic ceramic ,
-resistor : 0,24w,1%
1) 470,kohm,
2)100,kohm
9)22k ohm
1)100 k ohm ..
1) 220k ohm
8) 47 k ohm
2) ,10 John
2) 680.ohm
1) 47 ,ohm

---

12) constructional project : IR remote control ligth dimmer module,the circuit is based on a PIC 18 F ,1329-U/SI microcontroller ,a triac and and IE detector (IRD1)the two RGB ,LED. give user feedback in the operation and setting.
-power supply: micro synchronisation waveform connecting neutaj ,,derived from the mains via a 1kohm ,5w , resistor and a 470 nf (X2) capacitor and resistor act as current limiting impedance for association ,5,6v zener diode ZD1,the supply works as follows,for positive half cycle of the 230v,AC current flow via zD@,the ,470nf ,, capacitor Nd 1k.ohm ,5w resistor same time , electrolyte capacitor capacitor is charged ,up then for negative half cycle of the mains current flow ,via D1,the 479nf capacitor and the 1 k.ohm resistor ,the results is that the 470,if capacitor is charge to ,5,6v-0,6=5V..DC
Impedance of 470 nf ,series 1 kohm ,,micro,,5v supllie,up 23ma ,IRD1,, supply bcircuit two RGB

LED are connected six cathode connected to a different I/O pin the common anode two RGB LED connected together 5v,single 1 kohm ..
IR remote are amplified filter decoder received module IRD1,,the 1000 ohm ,resistor capacitor are module to decoupled it 5v supplies the data output at pin 1 of IRD#,is connected to pin 10 of ic# and configured..
-construction : intelligent dimmer is built on a single &sider PC board code ,799, measure 76mm×50mm ..

_____

Part list intelligence dimer ,
1.PC board code 799,acat from Epe service ,size 76mm×50mm
1. Ip65 sealed ABS plast case Witt clear lid ,size ,,125mm×85mm×55mm(jaycar HB-6246)
1.flush mount ,3 pin main socket ,jaycar ,PS 4094 similar
.1. IEC make chassis connect with mounting holes jaycar ,PP-4005
1.)10 MHz crystt(x1)
1)47uf, 5a inductor (jatcar lf-1274
1)4-way Dinklage screw terminals plug ,jaycar ,HM-3124
1(10A,ISC main cord

-semiconductors :
1 .pic 1
1.ie receiver
1.

-capacitors: 1470 ,16v electrolyte
-resistor ,: o,25w
- miscellaneous:
3M3×25mm nylon screws (to secure PC board.
2M3×15mm,nylon screw ,for IEC connector
3 M3 x12 mm nylon space ,
10 M3,nuts
-1)1 ok mm of ,0,7 mm dia times copper wire for links ,,
1)200 length ,3-core mains flex (250v,,10A ratt,
1) 4,8 mm res spade conductor,fully insulated ,
14,7m yellow spade connector duly ,5)100 cables tie

Add,part requirements testing
1)12 AC ,500mA,or 1A plugpacj,
1)12v,,300mA,ligth bulb (jaycard ,SL 2656)

-construction project:PIR -triggered main switch:
Futer detector ,20m away ,two pair telephone cable , switch unit also provide 12v power PIR detector cable switch main rates relay to switch the power twin 239 AC ,outlet ,relay contact rated 20A, switch. , 10A limited,10 different ,, switch power load any time regardless ,switch units fits ,UB2,size plastt box ,, switch itself battery operated and switch low device if about ,80mA,12v ..
:how it wot:block regulated 12 volte power , internal circuit plus unregulated,17C ,DC power virtual contact ,which are normal close ,open when detector Sens movemt.
Contact unit also connected ,12 line detector contact open R1,and it's output switch low ,this action issued set reset ,flip -floo ,normalt resting ..
Switches intu set state Q high used a transistor driver circuit energy relay ,power switch 239 AC outlet and loads, at same ,sR flip flop switch to A
Output multi stage remove reset counting pulse from simple clock oscillator ,which run 0,9374 the reason odd frequently clear , the binary counter has 14 stage but make only from internal flip flop 4 to 10 (04-19)and 12 to 14 (012-014) we rotary switch S2 to select one 10 output ,si rotor of S2 kept until the selected counter output switch
This happens a soon counter has received the appropriate number of clock pulses,eigth in case 04,16for O5for32,for0664,for 07 switch high after 8192 pulse been counter ,selected counter switch low situation coupled via capacity c1, resistor R# inverses I..

-main connector ,three connector ,iex green wire , yellow main wire ,T1 longer ,same wire 160mm , outlet socket ..
- insulating shield ,two outlet socket insulation material pvx ,
-final assembly: step the two plug into socket make noctch , completed box ,,
-Pir : testing or adjust..
In used ..

-parts list trigger main switch,
PC board code available service size 147mm×69mm
1)ub2-size plastt box ,197mm×113mm×63mm
1)PIR sensor
2)heatsink ,19mm,square t o-220 type ,
1pushbutton switch spst (S1)
1 rotary switch,1-pole ,12 position (S2)
Point knob with removable pointer insert .

,1)6- pin Rj12 socket ,PC board MTG (con1)or ,3way PC board mounting termi block
1) 14- pin Dik ic socket ,for I 1
16 pin Dik ic socket for ,
1) power transformer ,12,6v/2va,2851 type
1)29A mains rated relay ,chassis MTG (RLy1)
1)IEC main plug , panel mounting
2(mains sicker flush mounted
4 main socket ,flusg ,15 mm long ,M3 tapped,. nylon M3 machine screw ,10mm long csk head ,N3 machine ,6mn,long pan ,solder lug ,,nylon cable tie 100m ,25 mm length ,6 mm diamt heatsgrink tubing ,
-semiconductors: quad scmit band ic1,4093B,,4069 binaicounyer,12 regulatory,PnP transit,led green silicon ,,
- capacitor,
: resist

-capacityi

-explanation: Project a plethora of , together with the pic programming ,
-PIC training course.
, training development course enhanced ,pic programme module,
-bool expirmenting .
Experimenting with PIC microcontroller,this book introduces pic programming , jumping straight in with four easy knowledge 8 binary.
Explanation logic
- digital logic , circuit basic building digital circuit and system .
-possible , switch and lamp logic ,
-lofic gate with inverted output ,,
Y=A+B
Y=A.B
Inverter ,,y=/X..
And gate ,,or gate ,,and gate ,,nor gate. ,exclusive ,incluve gate.
-Bistables ..D type bistable ,
D-typpe bistable,,j-k bistable ..
-pratical logic circuit..

-build the circuit wizard way : opening to gates , gate number

Intruder alarm: real life application of simple logic intruder alarm push to break , advance...

- ripple counter..
-investigate : a block schematic diagram logic syst ,the system is designed to alert the flight crew visible and audio warning ,door switch logic signal respective door logic 0,when closed warning indicator active low requirements logic 0,to produce a visible audio ,study the circuit carefully and then see if you ..
1.what logic level appears at point of door closed ,wath logic level appears x,y,z ,,wath level appears point x,y nose door open other closed ..

- circuit surgery : collector feedback theory /bias ,,
A=So/Sai,,
feed factor,,loop gain ,,Sf°BSo

Sai=Sin-beta So
-So+beta So=ASin ..
AcL=So/Sin=A/(1+beta+A

<u>14. Files system. Record academic and certificate diploma,</u>

<u>1.Pocket number.</u>
<u>Implementation work</u>
<u>Data right,met investigation:</u>
<u>Project : drawing :</u>
Career project : theory circuit
Schematic
Experimental : workshop workplace school class pratical career guidance
National trade examination :theoretical and practical ,n diploma 18month
Memo tech ,
Project drawing: interpretation
-Mathematics graphic draw :project
Line point

-Electrical trade theory draw labell:
Circuit component make:
Resistor cell,baterrie ,AC DC circuit current,lighting washing machine , transmission generation AC inspection

-insustrial electronics draw labell
Circuit component make:
-engineering science
Graphic and circuit ..
- grade total career ,staff theory learn
Pratical exam test trade assessment
Engineering electrical.
-fault find diagram schematical .
Relay

-installes rules ,circuit diagram,

-lofic system

-control system :

<u>-15 .experimental,.projects pratical trade framework qualifications marks : certificate diploma 6 month semmester trade..</u>
<u>Trade theory -pratice frame work</u>
<u>Component frame ,electrical and electronics</u>
Drawing : make circuit tools process make circuit framework
Trade pratical engineering:level5,6,7
Process
Design
Designation unity| ,component| ,tool trade|
-male tool pincil draw
Make, resistor ,condensator charger circuit tools make drawing .
-makee installation lighting way switch :
-makee transmission ,generation ,drawing ..design.

3.experimental :project drawing
City power Eskom advanced career
Drawing workshop and workplace ,

Library on line project
On line. Power engineering,advanced
Scheneider,Eaton breaker design
-drawing diagrams city :
Metering circuit: design
Installation city transmission generat drawing schematic:
Installation:
-drawing interpretation: discovery electronics
Drawing make: installation
 security alarm ,police alarm design intelligence robot circuit timer 555..
Computer electr

-4. implementation integration system .
Guidelines guidence pratical school

Microsoft project azure ..GitHub ,visual studio gith lab
Work item : epic item project repository project issue project run project code source readme licence,IP drawing circuit

15.1 Trademarks
T Blaser tableaux
Met career police tpm , counter terrism ,
Engineering systems:met block mark
TMP circuit maintenance meeting break

Data right ..
Cell phone:
IP licence book rwiten integration : met career detective ,counter flip flop ,electronics ,CCTV circuit right , cameras phographic right lens zoom circuit , repaired center cellphone city vs transmission Telecomm office vs Microsoft office vs circuit power vs installation electrique compagny police data certificate copy license copy private police ,,policy city power Eskom policy claim drawing design power cost economic load ,outage circuit
.

Total ,pratical , policy claim vs claim alarm maintenance total career ,
Security safety claim nated counter terro record irregularity phase circuit complain circuit implementation:

-total framework policy vs police record LDR framew not meeting vs Terri counter irregularity vs

Total grand :grand council department energy Eskom policy ,city power policy terro counter emet. Irregularity mining company trade mark , telecommunication claim vs customer trade marks compone maint Tom .
-total grand met tblazer Salesforce energy claud metering energy co circuit incidence force sale policy
-data right energy metery claim. Vs alarm relay delay dimer switch.
Microsoft project azure blue defender
Regulatory factor ,limited Freq , energy cost. Bill cost energy

Intergration circuit switch. Record total
Physical meeting .. script inspection

<u>16..Experience pratical:</u>
<u>www elektor .con,</u>
<u>Test book</u>

Order booking :200rand ,,4eu
- microcontrol analogue audio , digital,test measurement.
-Pratical: quick to implement reusable multi plat form , fts.
-sub long term weather logger .
- ATM,18 compass.
- j2B universal MMI module using ,arms cortex ..
- FT232 ,USB Serie bridges/BOB

Chip kit first Arduino compatible ,23 bit microller development platform,design manufacture.
-Parallax : li - ion power pack charger
-reflow mate :
Supply voltage: 230V/50HZ only
Power : 3500w
Weight: approx ,29kg
Dimensions: 620×245×520mm (w×H×D)
Heating method: combined IR radiation and hot air .
Operation: directly using menu buttons and LCD remotely using PC software and USB

connection.
-menu language :
-temlerature range ;25 to 300°C
- Maximum PCB size :400×285mm
-temperature sensor : 2 internal ,
Optimal temperature distribution thank to IR lamps
- Drawer opens automatically et end of soldering ,
- Glass open automatically at end soldering process
- interactive commander for data transfer
Command | action
h =help. | Print available command
_____
-Current drawn by entire system at ,3,3 V
CPU
frequency| sleep mode | current drawn
8Mhz. |Non. | 5.8mA
_____
Fuse settings ATmega 88
Fuse | Ext| OxF9| 8MHZ intern oscill (divided hence cpu clock is 1Mhz
-$_____
-weathet logger operates supply voltage of nomminal 3,3v power over USB ,is available 17 ,VCC of BOB ,FT232R serial -to-usb converter module for stand alone operation unit power via BT ,, supply voltage between ,3,5v and 30,V regulator ic3 diode detector again accidental reverse polarity connection important employees reduced measure to maximise battery life in stand ,alone operation microcontrol is responsible cincentre measure effort circuit ,3,3 V under various conditions is shown , alkalt or NIMH ,AA cell , 4,5 v or 3,6 v nominal capacity of between ,2Ah and 3Ah ..record data for least 1000hours instead of three AA cell free the employee single ,Li - ion Lipo cell supplies ,3,6 or 3,7 ,, on power saving measure is to carry , 100second ,, measure system draws extra about ,2,5 mA ,,120 ms ,when taking reading in between ,10ms corresponding to the 1hz interrupt the device is from ,power save mode 59 second ,I/o clock micro controller order need to be count the pulse in order , CPU..
Result disping result
Test measurement:
HH10D humidity sensor module feature .
Re

Swegethttps://GitHub .com/milkmist)mist rewmaster tools / filter m.
Bios serial received firmware download request from the device.
Flyerm uploading Kerbal (83475 bytes
Upload completed (9,5kb/s.
Booting the device
Done
Hello
- the pattern obtained after numerous iteration of the command pixel [I]=y*y* x>>5..
Testing in development board ,,use serial port to upload application ,,serve a console for displaying the message sent to print f +) the Boras fitted with a ,3,3 serial port ,located between the ethernet and VGA connector ,pin marked ,board received the data marke tx is used by the board for transmission the GND is obviously ground ,3V3 is a 3.3 V power rail serial long use 3.3 level (not 5v or RS -232) or the combined devdlop
- organisation display of the measurements results ..

-CMOS compass module: board .kmz 51 chip ,the resistance variation in resistance cause voltage variation which is amplified,LMC 6036 ,sensor electronics magnetic heading us calculated micontroller bus ,corrected module positions ,pin 7 ,AC power grid in him parameter story EEPROJ
- orienteering ,4 load firmware power manufacture ,want to recover the module function bearing send following by modulating..
Wiring block
- digital communications with the robot electronics cmps module
Graphical representation of the compass point
-circuit diagram the construction file eagle files component list software
Keypad : consist 12switcges ,4 to the left of the display ,4 right , rotary encoder switch encode build push button three encoder space ,9 encoder build in button 27 button ,a5×6 Matrix need connect key I/o scane 4 key free way , function available some function make ,use diode avoided problem phantom key several press ,a situation turning the diodes package ..
Different variations on the 2×@6 LCD ,key swiy offset
.main function resistor R38,to R 44 board turned using button S1,s8,s12 key fitting , resistor provide. ,turn key circuit by battery function asymmetric matrix line have limiting resistor (15-R25) is final circuit ..
- display: board offers possibility of fitting ,2 line by 16 character (2×16) display ,4 line by 29 (4×29) ,,by 16 character connection ,5v power ..R ,36 ,R 41 is necessary T
relay ,R1 ,120package .
-Powering : the board main rail (V+) is 5v microcontrol itself ,3.3 derive,3 ,, are directly connecting the display available on transistor (piooo,6,,Pio 2,8. Etc pad k1 and k2 ..signal
- construction:

- implementation : board

- twitter message local area network LAN wireless configt.dialog
- communication on the dso board.
Detec signal the ratio signal generator DSP ,101dv,and this ,n level of ,94 db application peak to peak with sinuskidaj ,0,53 to 0,59 time supply average

Test measurement:
Component list
Resistor :.R1=220kohm
To R5
-capacitors : C1=4,7uf ,63 radial to C7=470nf.
- semiconductor: D1,D2=BAT42,
T1=BS170.
IC1=
Ic2=ATMEG,,
Miscellaneous:.S1,S2,S3=6mm switch ,PCB mount
S4= single -pole switch
X1=32,768khz quartz crystal
LCD 1=DOG @62w..
Mod 1=BoB ..
Mod2= humidity sensor HH10D
K1=6-pin(2×3) pibheader option iso interface
-20-way socket strips SIL for LCD1 ,,
18 -way(2×9) socket for mod @.ic socket for Ic1(8-eay and ic2 (28 -eay ,PCB hi
Settings and function button S1 to S3
Print circuit board.
Humidy sensitive used transducer elements frequency 6khz to 7khz measured AT mega ,value with calibration par ameyer again stored series module frequently counting the output pulses module over second ,the 16 -bit counter timer , capacity 64 kbyte,,stored,record ..
-soffward : firmware for the microcontroller is written in C complied using ..
Program in weather station,LCD to control display ....
- construction: double site circuit board diagrams components mounted in board ,socket solder components,fused iso connector ,k1, programmation job ,program used sensor module serial to

USB module , switch ,S4 position to select external power ,3,3

- operationel ,: treer button (S1,S2,and S3:,S1 cycle variouse
Setting
----_____

C28=C26/(4Q.Q×(1+Ao)),.
R24=2Q/2(wo×C26)
R25=(1+So)×R24,
R23=(2+So)×R24/So
If ,A=0,7071 and So=,these formulas sin plify to ,
C28=C26/4
R24=1,4142/wo.c26)
R23=R25=2×R25....
_____
Basemodu

Lab testing ..prototype audio convert implementation:
Component list
-Resistor=
R1=330 ohm
R2=680 ohm
R3= 470 ohm
Capacitor
C1=100nf
Inductor: tri ,home
-semiconductors
Led = standard led yellow
- miscellaneous, cinch so let ,solder pins ,USB audio
- circuit : circuitry design ,signal pin @, coupled resistor impedat former signal (0,5vand 75ohm) coupling transformer provide galvanized cover upper frequently transfo limited couplings toroidaj core material suitable signaj ,50Mhz ..
Construction: PCB

- schemat diagram of the flasher -
 Circuit the time integration module
Base e two operational amplifier ,A1 and A2 ,- ,non + input and output,varyyng voltage V1(t) is

applied A2 driver integrato ,R c and A2 ,Rc stage ,add resist
---
Light sensor :
With twilight detect: sensiu circuit
9vdc. to .15 VDC..ligth room circuit generate ,lm257 ,R1 and R2,,voltage dived ,,R3 and R 1 circuit ,
Ooamp ic1 wired buffer voltage LDR suitable R2,voltage pin IC,,,IC1,,, ic2,0 other ,,22kohn R,10two comparators ,ic2and ic 2b compare income p1and p2,0thar output R 90,be ause ,, determine dark ,ic2. and I 2..

-explanation teach ,in
A broad based introduction to electronics: digital to analogue and to digital conversion: electronics studies school college UK ,include byec level 2 award electronics diploma in engineering level 2 experienc
- e read ,teach teach learn experience test electronics circuit
Learn :
- beam break flash trigger ,build necessary time delay photo flash response IE
-Parts list active loop antenna :
- @ PC board code 813 (ant loop) 31mm × 94,mm
- @ PC board code 814 (rad loop) 58mm×48mm
-@weatherproof plastic box ,eg
130×54×83mm plastics box
-@8-pin IC socket
- semiconductor:
1BA4560 dual op amp (IC@
1 k8L08 or 78K10 voltage regulator.
2KDV ,149 varicao diode (D1,D2)
-capacitors
-3)100uf ,16v electrolyte
5,) 15 nf disc ceramic.
-Resistor (0,#5w, 5%)
..micelanot
_____ Beam - break flash trigger.: the infrared beam is generated by led1 to led3 and picked up by phodetector diode ,PD2,,op amp ic@ b function as current ti voltage ,while I 1 is wired as non inverting amplifier the latter derives

transistor A mosef briefly sait h trigger outbut when the or is interrut .
-circuit details:
Power isderiver battery in detector unit IRv beam from source unity OD ,3,5 mm jack plug con@ mate ,, detector unit IRv source unit ,IR pgotodetector diode ,is connector diode ground and the inventing input ,out site,,+1,7 v ,and +4,0v ,IR ligth is falling on OD@ dark ,
basically ,#2kohm ,,2,7kohn ,,220uf ,, Qrin writing amplifier ,, s
-Switching the triggers output: Q1 switched when IR beam falls on PD1 collector voltage is normally,beam interrupted ,mosef ..
-parts list :
IR source unit :
*1 PC board code 808 ,57×26mm
1)UBS size box ,8#mm×53mm×31mm
46mm long untapped spacer ,4 M3,×13mm screw ,counter sink head
nylon cable tie ,75mm long
12m length ,8cable
23,5 mm ,monk jack plug cable type ,
- 35mm IR ,led (led @ to led 3 ,1)820 ohm
-detctor unit :
1) PC board ,code ,size ,,122mm×58mm
2UB3-size box ,129mm,×68mm×44 mm
1)SPDT mini toggle switch ,s@
@)PC mounty ,,3,5 mm stereo jack,socket ,,
- PC mount ,15 mm tapped spaced ,8 M3 ,6 mm machine screws pan head
- 21 mm PC board terminal pin,, 19v ,,battery clip lead
1)8-pin Dik ,,IC socket ..
1)30mmm length of ,13 mm to ,,15 mm length of ,12 mm to ,15 mm diameter black pvx conduit or brass tubing ..
-1 piece of ,IRv- transparent red film ,approx snap connector or ,
1×4- way ,AA cell holder .
1×2 way ,AA cell holder

- semiconductors: dual op amp (ic1)
1Bc33,nob transistor ,Q1,IR pgotodetector,
- capacitor :

- detector board final assembly n: construction v
-cinverting scanners for ,VHF/UHF discrimination tap socket ,the basic setup for received ,159 MHz signsk ,,..
-
PC board is secured to black the lid M3 ×25 mm tapped keypads pluggi into machine socket ..

- precision resistor:
-Lcd module: remaining components installer ..

- digital insulation meter :
1) PC board ,code (main /dis)109mm×84mm
1)PC board code 859 (dc-dc con),70mm×51mm
Ub1- size plastic box ,157mm×95mm,53mm
1)LCD modut,2 line ,16 character with back ligthning.
1 ferrite pot core pair ,26 diameter enameled copper wire ,
1) 100mm ,lengtt ,o,7 mm diameter enameled copper
1)8m length of ,0,7mm diameter enameled copper wire
1)100 mm length of ,0,7mm diameter tinned copper
1)10×AA battery holder. 0,7 mm diameter pinned copt
1)2- pole rotart switch ,PC board mounting ,wit 16 mm,S1
1)SPDT mini toggle switch panel mounting (S3,S3)
@ Min Dil relay ,spt switch p with 5v
,2) binding post ,Bana jack (1 red ,1 black .
24 mm solder lug..
1) ,16 -pin lengi of Sik socket strips
1) 18 pin IC , socket
,4(25 mm ,m$ tapped metal spacers

Block diagram of the ,16 ,bit digital potential the desired out voltage is entered via keypad and microcontrol IC 2 the correct binary number to drive the ,16 relays in the ,R/R ladder networks
- arena loop ,

Experience trade mark , engineering science career ,motoring vehicle,power machine , engineering,trader
Compagny,Transnet motoring career , ford career Engineering system and Toyota , nated ,,
Magazine collection motoring reviews
-rwiten oral relate :
Specifications :
- 1.engine:
-cylinder : four ,in line transverse
- fuel supply : electronics multi point ,injector
-bore /stroke : 81,0/96,3mm to 87cm
-cubic capacity : 1799 cm cube
-compressiin ratio : 10,5 to 1
-valce gear : s-o-h-c ,valve per cylinder , variable valve timing
-ignition :five
-2Engine output:
-Max power iso(kW)103
-power peak (r/Min)6300
3transmission:
Forward speed
-low gear: ,3 ,142 to 1.
-2end gear :1,869to 1
-3rd gear : 1,235to 1
4th gear : 0,948 to #
Top gear : 0,727 to 2
- reverse gears :3,307 to 1
- final drive : 4,294 to #
Drive wheels. : front
-wheels and type
- road wheels : 16×6,5j alloy
Tyre make brigestonr turazan ,
Tyre size : 205/55,R 26 92v
Type pressure front : 220 kpa
Type pressure rear : 220 kpa
- spare : full ,size disc
5.brakes:
Front : 262 ventilated disc
Rear : 262 solid disc
Hydraulic : ABS , with end and bas.

- street :
Type : rack and pinion hydraulic ,speed sensitive power assist
-lock to lock : 2,7 turns
- turning circle : 11,6 metres
-suspensiin :
Front mac person strut ,lower wisthbor e gas filled dampers anti ,roll bar multi coil gas rear
- capacities :
Seating: 4/5
Fuel tank : 50litres
Boot space. : 304 dm 3:
Utily space :928 .DM cube
- warranty and service intervals :.
3 years /1000.000 km warranty.
5 years /100.000km service plan
Service every 15000km:

Honda civic 1,8 Vxi; Volkswagen Jetta ,1,6 Comfortline ,ford focused ,2,0 trend ,,
Toyota corrola ,180i
Test claim t 203km/h top ,speed and acceleration to 100km/h in ,,9,44 second Honda tops at 202 km/h achieve the benchmark sprint in ,9,39 second performance

- test data : .Amarok bitid ,4 motion
Engine :
-Cylinder / capacity : 4/1968
-bore and stroke : 81×91,5mm
-compressiin ratio : 26,5 to 2
Fuel supply:common rail
Injection
- fuel diesel .
-max torque : 400nm@1500rpm
-max power :120 ke@4000 rpm
-transmission:
Shift type: 6 - speed manual

- first gear : 4810
-second gear :2540
Third gear : 1.590
Fourth gear : 1000
Fifth gear :0,760
Sixth gear : 0,630
Final drive : 4100.reverse : 4.370
Loe-range : 2729
Control 4 WD selection type electron button
Wheels : alloys
Full-size spare
- 2.measurements (mm)
-height :1834
-length : 5254
-width : 1944
Wheelbase :3095
-fuel consumption:
120 km/h ,,:8,61/km
Urban : 9,8/km
- calculate range : 688km

- performance:
0-100km/h : 20,8 second
100-129 km/h : 4,86 second
rpm @ 120km/h : 2100
-recovery point :
Front ,,RHS
Rear
- underbody protect:
Transfer case non
Fuel tank : plastic guard Rea diff non
- odometer 6,248km
-load and towing capabilities (kg)
Tare : 1848
GVM : 2829
CVM: 4668
Towing capacity ,unbraked : 750
Towing capacity (braked)
- brakes :
Front. Ventilated disc

Rear. : drums
ABS ,yes
- load capacity (litre)
Load box : 2520
- warranties maintenance and service:
Warranty : 3year/ 100000km
Corrosion ; 6 years
Service plan : 3 years / 90000 km
Service intervals: 15000

- guard motor ,police maintance
Record
Guard gold platinum ion
Eligibility car

---

17. Specifications:volswat golf
Pricing :
Test pricing
Standard equipment; controle aluminium
- general data :
Kerb weight:1541 kg
-length:4212 mm
-width,excl mirror :1779mm
-wheelbase :2578mm
-weigth distribution front ,n/a
- ground clearance : 132 mm
- boot space : 275 litre,..
-utility space : 1305 litre
- coefficient drag CD : 0,34
Seating capacity : 5
Headroom front : 987 mm
Headroom rear : 979 mm
Hatch lift height : 2017 mm
- safety
-warenty : 3 - years : 120000km
-maintenance service : 5 ,years : 900000km
-2Engine:
Type layout : 4 cyl transverse turbocharge .
- valvetraun : DOHC ,16 ,valve
-displacement :1984 cc

- bore ,x stroke mm : 82,5×92,8
- compression ratio ,:92,8
-power kW : 188kw,,6000rpm
-torque; NM : 350Nm ,,25000,,500rpm
- power ,to weigh ratio : 121,8 kW/ tonne
- fuel injection : direct petrol inject
-recommended fuel : 95 unleaded..

- drivetrain :
Transmission : six speed
- gear : ration
1st : 2,92
2 end : 1,96
3 Rd : 1,4
4 the :1,03
4th: 1,08
6th :

Body frame with ..
Brake from : 345mm disc
- break rear : 310 mm disc
- wheels : alloy
:tyre :
- steerit : servitronjc
- steert ratio : 14,96
- turn lock : e
Suspt front : 10,9 m
- susoenst front :
Subjectivjy base averaged weights out
Driver ,gearbox ,steering ,vraj ride handling ,exterior styling ,interior styling sear , ergonomic control ,luggage space , percentage ,price value

- Performance:
Accelerated:
Speed / time
0-60kph / 3,17 sec.
0-80 kph/4,55 sec
0-100kph , :6,27 sec
0-120kph
- quarter mil , soeedo calibration ,120 kph ,error ,,116 kph / -3,3%

Overtake
60-109kph. / 3,31 sex
80-129/4,24 sex
Braking :
Average speed to zero
100-0kph / time / distance : 2,77 second /39m.
-fuel economy:
Real world test route : 72,3km
- fyej used : 6,3 litre
- our consumption:8,7 litre / 100km
urban cycle claimed : 11,2 litre / 100km
Co 2 emissions 195 g/ km
Fuel tank size : 55 litre
 - estimated crying
Test conditions: test car odinetr : 5396kn
Reading
-temperature:21deg ,c
Wind
Locay
,test note :

Car note
Hon payment calculator based ,19 percentage deposit:

<u>18.explanation: comparative test :</u>
<u>Subaru.</u>
<u>Specifications</u>:
-2Engine:
Cylinder : four horizontally ,opposed
Fuel supply: electronics multi - point injections
-bore stroke : 99,5/79,0mm
-cubic capacity : 2457 cm cube
- compression ratio : 10,0 to 1

Valvagear : s-o-h-c bank four valve
2 : engine output ;
-max power iso kW. 123
-power peak (r/Min)5600
Red line (r/Min). 6450
Max torque (N.m) 329
-torque peak (r/Min) 4000
3.transmission :
Type cvt
Low gear : 3,525to #
2end gear. 2,238 to 2
3rd gear. : #,641to 2
4th gear. : 1,194 to 1
5th gear. : 0,850 to 1
Top gear. : 0,850 to 1
-reversr gear. : 2,358 to 2
-final drive : 3,700to 2
-drive wheel : permanent ASD.
4.WHEEls and tyre:
- road wheels. : 18×7,5j
-types make : Bridgestone
-tyre size : 225/45,, R2891 w.
-Spare ,tyre and location ,spacy
5: brakes:
Front : 294 mm ventilated disc
Rear. : 286 m ,solid
Hydraulic ,ABS. Breaker assist
6.suspension :
Front : mac person struts
Rear .
Capacities:
seating:4/5
Fuel tank : 65 litre
Boot /utility space :348 DM.cube
- warranty and service intervals:
4 years /100000 km,warranty ,3 years / 63000km maintenance.
Test results:
Maximum speed (km/h)
-true speed. :210
-speedo calibration:60,,80,100,120

-true speed : 54,74,,93,,113
-odometer error :0,9 percent over.

*Accelerated,second
0-60. ,5,2#
-0-80. , 7,50
0-100. ,14/95
0-120 , 20,74
0-140. , .1km sprint , 32,15
Terminal speed : 264,4km/h

-overtaking acceleration: second
40-60. ,/ 2,53
60-80/. 3,01
80-100/. 3,65
100-129/. 4,41
- fuel index :
Manufacture fig :
9,2 litre /100km
Car fuel index :/1
0,92 litre /1000
Estimated tank range : 595 km
Taxable CO,2 rating : 214 g/km

-braking test :
10 stops from 100km/h measure in second at ,30 second interval on good bitumeise
-beat / worst stop : 2,70/2,89
Average of 10 stops rating ,2,79 excell
- geardsd speeds ,km/h
low gear ; 52 , 60
2 Nd gear : 82 ;94
3 Rd. gear. : 11; 128
4th gear : 253 ; 176
5 the gear. ; 299 ; 344.

- calculated at engin power , 5600 r/ Min and red line ,6400 r/ Min
- performance factor :
Power / mass (w/kg) 80
Power / litre (kW/ litre) 50
Power / litre (ks/litre). 93

Torque/ litre (n.m / litre
Engine ,,: 1124
Engine rev/ km
- mass tested (kg)
- test conditions :
Altitude : at see level
Ambiy temp / barometric press ,22° c / 2020 hPa
Test car odometer : 1765 km

-150000km warenty and five t ,100000km service

Comparative:
Test summary class
Hyunay test scores,25/29
Mercedes Benz blue efficiency,75/100
Opel Corsa collour
- hummer H3 adventure

Design and development the TBM ,,700 is singles turboprop engined low wing monoplane aluminium and steel construction the TBN product PT 6 A ,rates at 850 sho (634) ,,522 kW take off and landing cruise flight engin power,859 ,,634 the extra ,,2529 neutical miles (2829)
-General characteristics:
Crew : 1 or 2 pilots
Capacity: 4 to 6 inclus on passenger .cockpit
Length : 10,65 m (34 ft 11 in)
Wingspan : 12,68 m (42 ft 7 in)
Height: 4,36 m (14 ft 3 in
Wing area : 18 .m.n (193.7 ft
Empty weight : 2132 kg (4699 lb)
Max take off weight : 3354 kg (7394 lb)
Max playload : 385 kg (849)

- performance:
Maximum speed : 593 km/h (320 knot ,368 mph)

Cruise speed : 467km/h (252 KTS ,290 mph)
Range : 2813 km (1519 NM,,1784 miles
Service ceiling : 9450 m (31000 ft)
Rate of climb : 12,09 m/s (2380 ft / Min
Time to climb to 26000ft

Based .
Price : | POA
Number of seats and luggage : 2 seat ,34 kg
- engine type : Lycoming
-fuel burn : 23-30 litre per hour
- tank capacity: 136 litre
- range and endurance : 2384 km
- propeller type and oper: sensenjc
-undercarriage:
- lead time orders: depend
-standard avionics: vrf Panels
-
Speed |. Size |weigth
Cruise:147 KTS| length 6,2m|MTow:794k
Stall:38 KTS. | Wing:85 m| empty :460 kg
Vine:171kts| height :1,8m| useful: 334 kg
-pulk out plan

Explanation VIP.
Paint protection that actually works approved by major Manufacturing in South vehicle shield ..
-bonnet guard ,
Headlight,front guard,side guard ,,repaired scratches ,stones Chios ,damage ,film removed ,film warranted 5years peeling ,bubbling and cracking
-_____
Journey|price|engine|power|torque|
27sxt. |
Maintenance plan: three years /100000km
-fuel tank:78 litre
-averagr sales per month

-service plan

17..Explanation engine calculation

How to calculate bore ,stroke displacement

-volymetric efficiency VE=3456×cfm÷CID× RPM,,

-Cubic inch displacement=NOC=Noc×SV

- head gasket volume: HGV=HGCT×0,785×BORE:

PVD=0,7854×Bore×DPD)+)+(VPD-VPB)= piston deck volume

- compression ratio CR=1+0,7854×30RE×strokr÷ccv+HGV+PDV.

+ISH=HP/16 : fuel system injector size per horse power..

VE: volume office,

Cfm: engine air flow rate cubic feet per mine.

Cid : engine displacement ,size volume cubic

-RPM= engine speed revolution per minute .

- NOC: number of cylinder

-bore =length

-stroke = length

-HGV= head gasket volume

Hgct : head gasket compressed thickness.

PDV:piston deck volume

DPV: piston distance

Or ..

SV= sweet volume .

CR= compression ration

Ccv: combustion chamber volume

Ish = injector size per horse .

HP: horse power

--_____

18.Explanation: engineering science ,stress,unity stress,type stress,unit for strain , elasticity ,hook low, straight, ductile material,young module elasticity..

-explanation : applied thermal engineering

engine testing: structure

.explain performance measurement:.
-basic parameters:
-measuremsnt of speed .
- fuel consumption measure
-measuremsnt of air consumer
- measure of exhaust make
-measuremsnt emissions.
- measure of brake power :
-measuremsnt of friction horse power.
- performance of si engin
-porformence
Calculate speed in evaluation performance development
: charge load
-bp=2πNT÷60, break,,2πnt/60,, AL ,,N.K/60
-specific output:
Specific .
Volumetric efficiency
n=mass of charge actually scke in÷mass of charge corresponding to the cylinder pond conditions.
-relative power air :
FR=actual fuel - air motion÷stochiometric fuel -air (bsfc)..
- thermal efficiency heat balance ..
Brake thermal
efficiency:= bo÷ m.f×c
-performen e:
Heat equivalent break work rejeter to cooling .
- heat career for engin ..
Heat balance sheet.
Input | kW| %| output | kW | %
_____
-explanation: construction techniques:.
Petition: record
-structure ,model aeriplane.
section :;.
Side :
Model assembly details:
Covering and finishing.
Refinement.

-construction note

Letter : .....
Materials:

-letter,|number|name|size. |Masse
A. 1. Gear 1/4 ,

Seat,frame,back,fender,back,Fook, healings,front,front axle,wheel,gasttank,rivo..
--- three wheel motorcycle: motor driven car ,,
- simplified concrete mensonery planning ,mortar ,concrete = A.P/s
-
---_____
- explanation study material and fire arm ,ballatisc
Gun
Typical muzzle energy of fire arm:
_____
-fire arm (except |calibre |muzzle energy
-air gun
.Ek=1/2×v×v(2ft.LBf/7000gr×32163.f.t.t/s.s
E=(m×v.v)+
K=450,95(2×32,1930,700)

-spefication
-Calibration:9mm ,para ,40s ,
-ovarall length : 2184 mm.
-barrel length :5
- high : 240mm
-weigth:0,81k
Construction slide
Magazine : 24 round sign front ,GPS
-test firing results :
-Ammunition : group
- factor : -41mm.
- hand load :51 mm..note accuracy average.group..fired ,25 mm...

-artillerie ,AM×30F@
Characteristics service
-types : canon automoteur,utilisation
Conflicts.
-characteristic
equipment : 4 home piece piloted longer left : 10,23 mm

Larger weight:13;10mm
Hight : 3,17 m
Mass in combat : 43,5 tonnes blindage ,size ,case lunch..

-report installer:
- mounting battery replacement step remote:
- connection to the fence
-connection , configuration
-pc board replacement
- service condity
-Pc board ,F1,Fu ,18 vac fuse..
-Lcd display,18 LCD ,7,2 output in 500ogm
Energy out put .500 ohm ,joule
-9000v ,zone monitot,1/2 control display,2 max gate
- gate and panic button input time gate ,yes
- alarm output ,siren output ..
-power consumpt under normt operational conditions ,18VA
-battery time charge ,24h
- solar power operational,60 Ah
-wire in a Serie : galvanized : @,2 mm : 5 m optimal..
High voltage ,set point :10,00 volt ,set

Balance rate installation: item..design draw element ,security access plan.

Card access reader mount type technologie.
-biometric access reader mount type be specific.
-keypad device.
-keypad,kepead securt.
-card reader with key..
- horn siren
- weather proof him
- horn ,strong
- strobe.
- car reader with turn attandance,
Tensile,revolving door
-traffic arm.
-vehicle ,exit device ,
-smoke detector,
-heat detector.
-gaz detector, carbon monoxide,electro lock, push button ,camerarwite,camera ,with intercom,

- security window scret ,heat detect,
-window contact,vibrasic,glass,floor,car drivers,overload,dual tech ,contact saity,wall motion,floor motion,
-beam fence distribution,
-

19. Explanation : pratical school
Disciplinary hearing school . trainings system orientation school career guidence
:
Experience trade explain: career skill

-explanation: safe road usage teacher manual secondary:
-explanation the foundation for road :
Meaningful maturity,human dignity mordaly depending decisions,making responsible action , identification of criteria, phylosophie of life ,inclucating road safety , various level human , existing in frame of reference,co existing temporary,relation ,
- explant:the origin of technology and it's implications Forman ,technology and responsibilities ,Sens of responsibility and Education,the task of the school, requirements of the school,road safety and involved in accident, accident according degree ,type of road user accordt to racial group involved , statistics cost alcok poor vision .
- explain: traffic training secondai ,content of traffic , traffic situation,those involved,road safety , certain criteria for ,traffic training ,certain requirements , content method for ,youth levels ,abuse among , legislation and low enforcement ,vehicle ,trafft ,element , traffic hours . Trainer methods conversation,self , training, Education orientation,
-expt differential teacher road safety education ,basis off teaching from road ,child involved , inequality child different safety Education ,road Education for school undertaking parent school local ,,locak
- explanation different road safety education and the secondary: Education concept ,secondary school ,diffet road safety , Education central ,road safety ,road safety situation, road safety orientation,road saft Education road attitude , secondary child personal,goal diffential road safety,road safety matury, psychopedagogie persscpectuve, fundamental pedagogic perspectt ,social pedagogic , didactic , orthopaedic ,irthopedidact, realisation , opportunity and road safety education,
The school , secondary child basic ,,

- explanation:the methodology of road safety,goal of traffic Education , traffic lesson objective,the learning objectives, problem settings and problem solving ,
- lesson structure and form..
-explan group course lesson , actually preknowled, actually , unlocked of new , evaluation, group discussion,class arrangements,quality teacher ,skill the teacher and group,how to handle group ,group cohessiob ,criteria for judging the success of ..
General methodology guidelines.
-chao teaching aid road safety education :
Teaching lessons modalities teaching didactic , a schematic presentation of Education , teachings software .
Teaching wath look like ,teaching wath , teaching broad ,blackboard ,conograpguc teaching aid ,poster brochure model..
-thw sons box training ground the overhead projector ,
- the overhead projector film projector .
-selecting teaching a lesson ,nature , didactic consideration,
-road: safety ,nayv,point of contact in road safety ,few partie , department transformer provincial authority vlocal , evaluation ..
-calcul situation traffic possible, criteria,test total traffic situation,different large ,self orientation up him self regards world self discovery evaluation accepted road,lesson telling lesson subject road ,time 35 minute ,lesson objecy explain pedestrian ,setting problem pupil ,stopping ,self realisation , instruction control ..
Topics :Lesson objective to explain ,learn objective pupils must knowledge the application legislation and must able to mention aspects which ensures safe , pedestrian.
- explain the problem: LinkedIn up knowledge pupi will be led to the realisation that injuries pedestrian behaviour is not only annoying to other dangerouse during lesson phase new content is gradually unlocked ,
- scheme consider energetic behaviour on pavement keep try to walk next another , stepping pavement intersection trafficking ligth buses getting out of vehicles.
- the course of , actually preknowled the pupils citoyeb Saturday morning ask

Unlocked behaviour pointed outcome traffic legislation is explained content , mentioned in problem solving is unlocked b,
- explanation : functionalism : practising of acquired insight by mean model or diagram on the black board may explain how the will intersection as an assignment pupils observations and make annoying and effective behaviour of pedestrian..
-explanation defensive driving; road sign ,warning sign ,guidence , regulation sign , traffic bsign ,hand signals ,flag signal ,overhead lane flashing signals, road marking,

- explanation: rules of road vehicles : control theory test driving.mirror blind spot ,signsk clutch ,speed control breaking ,gear change ,motorcyy ,board inspection , inspection staring , Explain manouvring test moving running left speed control changing ,incline ,turning speed judgement emergency .
- the driving test : light motor vehicle, heavy motor ,the years ,staring procedure ,moving off , inclined ,alley docking ,reversing ,making a left turn ,hand signal , parallel parking ,the road test ligth heaving , light and heady .
- changing lanes ,stopping in traffic , stopping parking , turning at intersections, proceedings ,stop traffic sign ,entering a traffic circle, leaving a traffic ,block pedestrian ,level crossing , overtake,entering ,leaving freeway ,overtaking ,on a freeway passing , freeway on Ramp..
- explain test checklist record , faillure manoeuvre point ,exceed time limited 29/18 penalty , roadworthy, violation traffic low , uncontrolled action , dangerous action , collision,

20..Explanation:

Management system information:

pratical

Science motor policy guard

-statement of insurt; statement of the administration,vehicle eligibility, important servit,policy commence date, replacement of components,claim procedures,cover provided this policy , components Covered, beneft: classic,bronze silver ,gold, titanium, polyester ,ceramii , additional silucd , transfers it,exclusion form cover ,limit

Silver,gold titanium ,limi of indemnity,wear and tear restrictions, consequences damage,cancellatt,jusdiction currency and dispute,fraude ,quality control,insurer rigth after , service history intarion , statutory notice , resolution.

- explanation : road warranty all passenger commercial maximi carrying capacity 200kg , cover the cost service maintenance accident ,petrol engt service relevat as .

-displacement interval .petrol diesels electric maximum service run over if 1000km or 30dats occure RMI repair claim ,

- policy vehiclt schedule still subject to Manufacturing warenty plan motor guard plan.
- faillure occuring 39 days .
- replace claim process in event of mecanique construction fail occury.
- Owen ,policy number , current kilometre ready,partict of clay ,item cause quotation,address vehicle inspected service record invoice submitted with 45 days , benefits ,5

years ,120000km ,18 years ,160009km
- description of good stolen property must descrt very accurate bear it in mind invest official searching good ,
-makee or manufacture ,modej not years ,years of products, serial number ,registration ,engine and chassis ,size ,colour ,completed ,state midst iteb ,charge that change ,

_____

- 22. explanation: industrial administration management
- explain : general framey historical background complexity of management
- general princy and groi of management thought.
-growth of management the pioneers
- outline of managet theory : definition
- business orgat: organisation the diviy of managet,
-growth of organisations stage growt ,orgabiy chart , organisation rekatu,
- organisation problem : corpsratt planint traditional and modern organit theory future reauit ,
- production marketing and admnistration.
- organisat and the manufacturing fynctt stage in production manufacti,organisation of production the manufacturer functions:
-:Products the ancillat functions b; maintent production planning and control store keeping purchasit handlit of material.
- products the advisory functy : work studye time ,method

-production the advisory functions : work study time study methods work study , ergonomic , operational research inspect.
-marketing : marketing's organisat: admnistration area ,personek management wage.
- growth of industrial relat: trade union unions emply associt collective bargaining and joint negotiation:
- personal managent : motivation of management content of a personal policy achievement of harmony of objectiy:
- the person's department staff recruitment, the manager .
- personnel functionalite organisation if personnel department staff recruitment sciencetif selecti
- job evaluation and : wage structure determining the wage structure merited rating personnel problem induction training wage and salaries:
- personnel problems: disciplinaire promotion safety labour turnover management by participation personnel statistics ., part four financial management and statisciak ..

- financiere management : scope of accounting provist affinaire source of finance.
-outline of financial and cost account definition the purpose account , fundamental accounting transit from financial to cost accrost , classification.
- of cost controlling cost absorbing factor .cost miscellaneous overhead absorpty , overhead facially ..
- cost account system : process casting batch costing hybrids costing ststt organisation for labour orgat for material cost organisat for overhead ..
- method of casting and control : marginal costing decision .
- profit and efficiently and loss measure capital expendy decision .
- statistical method :
Chart and graph statistics quality control .
Designation experimt time Serie published statisic..
- part ,five the industrial environments:
The middlege to eight center the industrial revolution from development of large ..
- principal development in some ,major : coak iron and steel engineering textile chemical and artift fibre ,scienty research..
- the economic ent:.demands and supply cost of production types of compety resale price maintenat the general economic situation.
- general principles of financial and visit low banking and finance trade credibly commerce the merchant bank and issuing house hire finance industi and commercial Indy corporation for industrial negoy instrument.
- government and industry: introt devet of govert organisation of control .
- necessity for government control :
- element of legaj system : the low modern communities source of low common low system Englanders and Wales legal person the idea and property.
- general princiy : of contract princt of contract and commercial law ,contract ,tart liability for dangerous premise agent sale good , miscellaneous commercial low matter,
- elements of industrial low apprenticeship contract of employment factories act Offit premise ,act social insurance industrial arbitration industrial relations general managent division function ..

- explain award bid clause ,price industrial minimum salair ,flow manufacture process lighting tube. Design process:
Order ,item price : product case

24. Explain: pratical school regulation and irregularity

Vocational guidance theory and practice:

-1 vocational guidance ,

-2 explanation: psychological explanation of occupational trait and factor personality development , social learning ,decision making autonomy,

-3 explain sociological explanation of occupational ,choice class gender ethnicity group , opportunity structure an interdisciplinary framework.

4- explain , the interview: philosophy, structure questions talking silence , listening ,non verbal communication information and advice.

- 5 , explain traite factor client centred , psychodynamic, behaviours problem silvt , fantasy,the place of counseling in vocational guidance.

-6 Career Education: explain objective: structure and occupational information the curriculum evaluation.

-7. Test interested questionnaire,self help instrument computer based guide special program

- re written career guidence ,total faculty subject total grad time table Admi total grand reason career

.

-explanation: study of occupational ,self study of occupational.

-qualification obtained your present position how college.

- how to choose career,: knowledge of occupational finding about occupation , know yourself.

-how to apply find employment,way find .

-how to apply for work .

-how work relationship, introduction, different kind ,your concept relationship ..

- communication ,danger

--explain , psychological test : instrument , mechanical and technical aptitude.

-qualification| work do to choose career

- occupation | social conduct , relation social .

Psychometric

-Personality and aptitude profile confitial psychology

Name :

Interest ,| attitude | verbal reasoning , vocabulary ready completed| factor | personality

- test results reported | survey councillors .

- profile / v(y) ,,

Batteries ,

_____

-explanation tpm is profitable,direction in production achievement zero breakdown the parko

factory.
-RPM challenge limits from four devet stage , definition and distinctive features Tom striving for overall equipment effectiveness tomb,defect prevention system ,between , Tero technology and
-explain: maximizing equipment effectiveness , equipment used at half effective.
- breaks motor stoppages imped automation stop acceleration the deteriore of equipment.
- explain preventive maintenance alone cannot eliminate breakdown five counter measure for zero breakdown.
- unlicensed operational of automated equipment errors equipment investment, five tpm development.
- organising for tpm implementation the twelve step .
- step ,announce top management decisions to introduce tpm ,step 2 : launch Education companies.
Step 3 : establit create organization's promotion.
- established basic Tom police and coak .
- formulate master plan for tpm ..
Tom , implementation,and stabilzat.
Step 6: hold Tom
Step 7: improve equipment effectiveness.
Step 8 : estabt autonomous , maintence prograyfor operational.
-step 8 set up schedule maintenance program for maintenat.
Step conduct improve operation and may skills ,step initial development equipment management.
Small group.
- integration small ,small group goal coincii with goal ,
- evaluating the maturity of small group acty the functionalite of top many in small group .

25.Total maintenance product,,meeting police ::

-explanation: director social worker practice theory and skill,
- explain social work,an overview.
Direct practice domain phylosophie and roles .
- overview of the helping process.
-explain operationalizing cardinal social work.
- relationship building skill community with emphasis and authentic.
Verbal following exploring and focusing skill,eliminating counter productive communict patterd multidimenst assessment,
- assessing intraperst and environmental system .
- assessing family function , forming and assessing therapeutic group,enhancing motivation,with involuntary and ambivat client,negot goal and formulating contract .

- change oriented phase ,planing and implementation change oriented strategies.
- enhanced client problem solving skills assertiveness.
- modifying envit developing resource and planing ,.additive emphasis interpolation confrontation ,managing individual famili and organizat barrier change.
-the termination and evaluation phase ,
Explain : final phase termination and evaluation of code ethics,timing and intensity ,of self disclosure.
-A paradigm for respond authentic stimulation client message.
-Fuel for authentication response.initiated by practionner.
- positive feedback form of authenticity response .
- relating assertivei to client saying no and setting limit,
- exercise in responding authentication and ,client statement model resnse ,in surface underlying feeling , answer to exercise to discriminate level of emphasize response.
- explain: verbal following exploring and focusing skill , maintaining psychopedagogie contact with clients exploring problem.
Verbal following furthering response ,paraphrasing response,open and closed end , responding,client statement,seeking concreteness ,modeled response , summarise response analizing verak following skil ,
- focussing ,a complex skill selecting topics ,exploring topics depth blending open ended ,empgic response maintained focuy.
- evaluation used of focussing , response ..to exercise,answer to exercise identify in close and ended response ..

-explanation : eliminated counter productive communication patterns: impacts of counter productive communication patterns : eliminating non verbal effecty communicay culture nuance of non verbal ,other inventory of non verbal patter of responding
-communication barrier eliminate verbal to effectively,gauging effective response the challenge of learning new skills.
- multidimensional assessment, critical role of assessment ,
-assessment an ongoing process , assessment as product,include strength in assessing,sources of information verbal report.direct observations of non verbal behavt observations interatclient monitoring collateral source of infot.
- psychologi test ,
-computer assisted personal experience based on direct interat.
- the importance of self awareness.
The multimensionaliry of assessment.
-the problem identify the clarity ecological factory assessing devetneed stress association.
-key factor to be addressed.
Manifestation of the problem, participate

-explanation: source of information verbal report.direct observations of non verbal behaviour, observations interactive.client self monitoring,collateral source of information.
- psychological test., computer assisted asssessor personalite expression based on direct interaction.
- the importance of self awareness.
- the multimensionaliry,of assessment,the problem identify the clarifying , ecological factory assessing development, participants and system implicated in the problem how participate. , development stage and life transitions.
- severity of the problem meaning client to problem.
- site of problematic behaviour the temporary context of problematic.
- frequency of problematic, possible alcohol, substance.
- child maltreatment.and spouse abuse .
- client emotional coping effort skill strength and skill of client .
- cultural and social class factor questions to be answered assessment other factors .
- assessing interpersonal and environmental.
-the interaction of multimensionaliry humans the introper system , biophysical characteristics presentation.
- physical health cult factor in social support , assessing use and abuse of , alcohol and drug , effect of abuse alcohol dual diagnosis in , biophysical social , using interview skill to asses possible , alcohol ,using instrument and procedures assessment .
-assessing abuse ,use of instrument and procedures ,conveying assessment finaling client.genetic factor psychiatry.
-cognitive , perceptual , intellectual judgement , reality testing, cognitive flexible ,value misconceptions, concept, interaction between cognition emotional and behavioural,
- emotional functionalite, emotional controls ,range of emotional, appropriate of affect ,assessing effects disorder ,bipolar effective, bipolarity ,assessing social,.- : motivation: precipating event and motivation,in volunteering client ,culture norm , different, determined pattern degree of acculturation , bicultural and mental health ..
- fluency with language problem solving , achieved credible, providing immediately benefit attitude ward , environment health and safety factor environment resource universal need identify relevant social , system social support system .
- negative social support system assessing reciprocal interactive between individuals , instrument to , environmental need of disabled.
- assessing family function the evolution of family system.
- system framework for assessing .

- family functioning , family home , content process of interaction..
- sequence of interaction employment circulum explanation , assessing problem.
- outer boundary internal boundaries and family subsystem family power structure , family decision making , family and range feeling ,gosk , family myth cognitive communication styles of member ,
- forming and assessing therapeutic group ,classication of group formation of therapeutic,group established group purpose,Agence and practitioners perspective.
- established specifications individual group goal..
- conducting preliminary interview.
- group composition.
-open versus closed group ,size frequently and duration meeting.
- voluntary versus involving ..
-assesin group process, assessing patterned idify group alliance , group norm value ,
-enhacing motivation with involved , applying concept from social, initial contracts structure of initial interview..
- using confrontation facilities.
- negotiation a problem search bargaining with clients getting mandate off your back ..
- exploring self defeat consequences,resolving ambivalence in family creating incentive culture hope , highlights strengths modifying cognitive self .
-negatiatinf goal and formulating an rational contract ,purpose of goal ,type of gosk , guidelines for selecting ,process of mutually selecting ..

-<u>26. labour relations in education .</u>

<u>- termination for labour in education</u>

- act and bills for labour low in education .
- explain: an historical, clarification of concept the development of labour ..- the of exploitation racial discrimination,

Explanation: era of advertisement ,the era code termination and cooperation.
- development of Education labour relations.
-sources of labour , labour relations and the constitution.
-the common low and labour legislation for Education.
-the rules of natural justice.,
-the contractor of employment,labour relations act and related labour low.
- labour legislation for Education
- individual employees relation .
- defining employees and employers in education.
- employees right of employment in education,
- employees right of employment in education ,
- fundamental right .
- duties of educator as employee .

-dumie of employees
Skill development and Education ,national skills authority ,seta for Education,
- learnership in education ,
- collective labour ,freedom association, organisation right of trade union ,.
-collective bargaining in education,collective agreement,managing industrial action strike and lockout.
-responsibilty of manager ,
- procedure during strike ,duties of manager , established and implementation..- fairness in workplace disciplinaire:
- substantive and procedural fairness,fair unfair dismissal , progressive disciplinaire ,
- workplace disciplinaire Education:
- incapacity ,poor work performance,defining poor work, procedure incapacity, health injury , definitely health

...

29. Explanation :
- Principle of commercial low :
Large credit ,agree small intermediary,
- explain: size of agret, regulation, concellation of registration of credits b,
- registration of definitely counselor credit .
- consumer credit policy.
- source of the low , statutory low or legislation.
- the constitution .
-the customer low,judgt of the court ,old authority , foreigners low , case discussion.
- the court in republt t constiy court ,
- the constitution court .
The supreme court appeal ,high court officer of superior court duty
- officer the supieur court duty process master .
- magistrate court .
- doctrine of store decision ,Cree case create judg .
-application of the doctrine :
- interpretation status : the relationship bet the star decision rules the general principles,
- court judgement : ration decides .

-:the term : low rules ,meaning low rigth, legal subject legal objt, intellectual,private low , protection , servitude bself defense provocation .
,- term of the contract : essential natural and incidentally,condition ,penalty
- contract of sole: the our,chosen is entitled to be protected by seller again b,for content ,
- indemnity insurance.
- determinat of the amount payable non indemnity insurance ,value house ,.
- relation diffusion form intellectual,
- franchising : mediation, arbitration,award
Statutory arbitration,source of the low of arbitration ,matter excluded form arbitt ,national cause ,matter relating to ,criminal case ,validity of arbitration agree ,the arbitration agree ,the power of court in relation to arbitration agreement,stay of legal proceeding where there is an arbitration agreement appointment of arbitration,power of power of partie , appointment of arbitration ,power of partie to appoint arbitration to fill , termination of an arbitration ,
- notice of proceedings partie , summing of witness and recording , evidence manner of arbitration award the act ,time manner and publicat of award refused to sign must does not invalidate order specifications,setting a side of award ,cashing of cheque,the relationship between card ,issue and card hold traveller ,the low of trust basic feature a ,trust transfer control ,, right consequences of windings the effect of windings, liquidation meeting land proof ...- the low of administration of estate ,the executor ,appoint , furnished of security removal and dischat ,master , preliminary work ,death notice , letter accept ,band security ,making over in space ,completed sell , redistribution agreement payment to creditor on brief

30. Explain: practice school management

- management characteristics of management styles the main components of .
- planning: explain planing cycle different level of planned the need for planning policy general guidelines for effective plan
- explaun : step decision making ,routine and innovative.
-explain : time management the importt plannit way in which time is wasted making effective .
-explan time table drawing time variouse , drawing up time various types of time table ..
- the annual programme , purpose of the annual progrt consii drawing,
- plannt preparation and record and keeping.
- culture activity in the debat society youth activities religious movements , competition.
-explanation sport actuy ,the aim of school ,sport police,
- basic requirements for successful organisation and control , organisation of sport various.

- the education value wells organised .
- Education execurssion
- officii applit for sport.
- officit applit plannit and organisations, number of excussioner ,prior asssssmt ,follow up teach.
- follot up after .
- teacher and human relations ship ,teacher and authority ,teacher and the princit, teacher and principles,teacher and colleagues,teacher Nd pupils teacher parents ..
- class organisation and routine .

Definition of class room management.the relation between teaching class manager ,
- the important of classroom management.

-element if classroom management.

Organising the classrt to create atmosphere for learning developing an effect classroit routine.
- furnit arrangements changii classing storage and stirat facities..
- laboratory organisation pratical work .

Grouping and teaching.
- the structure Education department,head office advisory council for Education and training, regional control , circuit area office board of control ,board of many ,school committee hostel board ,parent teacher .
- type of schot secondary school ,special school the .
- explain correspondence and filing system:

-the prescribed filing system ,subfiles ,

Directive regard mail ,register

The school journal ,the visitor

Matter arising from incoming corresponding.

-explain : in service training: in service training for staff development aims the in servit training.

-the task the principal: substance a travelling allowance

Decentralized in service training role of head office in service .
- delagating :

What Delagaty means ,who delegates , in the school , difference bet ,the of delagatiib .
- - co ordination : co ordinating teacher work ,subject meeting , coordination pupils ,
- performance: perfot appraisal performance appru , performance effective common value ,reviewing and analyse career development.
- staring equipment,storeroom ,stick keeping teacher in charge ,papper order book kept number item ,
- safe check labo rules maint conductivity head office directorate ...- responsible post school ,power durie .
- didactt oriet instruction and learning ,

Didactic principt condition ,the currit ,aim of the currit ,the selection and oral,(arraignment of learning ..
- dudacting method and each ,lesson presentation evaluation ..

- defining didact science pedagt ,.- didact and other relating teach ,didacic .
- the didactic activit ,the didactic situat,general peadagogic andragific .
Didactic environment.
- tsxhook as didactic nature and structure ,task of the ,teach learning ,tertiary education institutions non firmaj cybernetics ,system theory .
-------_____
explain: activity guidance,
-explain : self knowledge psychopedagogie , decision making stage ,
- choosing partion,examinat,tertair Education ,social conductor ,human relationships,the work.
-need that can fulfied through work ,the career attitude towards.
- testing: questions such follot may be set nocturak pedestrian shi preferably.
-a grupe discussed: stlabutthem courtesy and road usage
-the educational objet:to orientate the pupit in the relationship between coutsey and responsibilities.
-the learning objectives:to identify the character of courteous road usage determine level .
- to accept a losit attit award the requirements.
- explain : solving problem : during the unlaxjinf of new mean of discussion teacher must si that follotbasic fact concerning courteous road usage trafficking.
- pupils Alfred have knowledge: steering : it is difficulties to determine the main character the relation courtesy and is not clear jointly lesson problem is formulated ..
- good maneee : unlocki new content pupils asked traffic low pupils matter how disret further points ,
- dunctt: characteristics of courtesy can applier motorcycle .. evaluation pupils completed self questions,@= alway, 2 = often ,seldom
- traffic ,control
- questions: wath is functt if a lesson objective ,his is lease object ,why is formulated of a learning objectives important in term minimt an skill level of achit.
- why is lesson problem import give 4 reason..-what us primary with demonstrate lesson ..
- wath is importy.
- during introductory phase of lesson them .
- which important prerequisite applies to group ...
-----_____
<u>31. Life training religious,Cristian culture, art buchellor :</u>
<u>Explant: administration Guide master form</u>
<u>- explain spread gospel pratical</u>
& Admnistrat Guide master form ,
- questt after asked about .
- introduction letter church member...
-suggested sheet adver,suggested 1st years scheduled (33 weeks ,
- application form admnistration,

-student address planer,
-recors of tests marks and exams ,paymet of fees register,
-attandance register , assignment register.
- order for code cost and note ,record of orders,
-certificate warding sample in cover ,
-bible school survey compus registraty.
-please take book apart except the last two sheet important documents read, certificate sample , certificate merited , certt Christian service ,diplome in Christ lead ,certt in word minister,licenciate in Christian ministries ..
----------....

-32.explanation: marketing reseat the research process and problem .
- structural eqt models ,neural networks,social net,
- analysis ,factor analyse ,cluster analysis.
-cass part , winscon power,stormt equt,canopy of core ,canopy production, food ,transitional housing ,picty word megabyt of ...- equipment,fabut
-research report ,fundamt criteria if form of report the oral grapt presentation.

- students guidence to office autimat : .
Office start four kinds of infot infirmat processt operational office ,procedure office system office,
- example of an office system designing and office ,system the impact of office automation on job.
-office automation hard ,
- computer and office how computer work disk drive,work disk driver input output ,device networks other office automation hardware.
-the electronics desktop,system siftt ,operating system task operating syst command .
- operating envy.
-recors keeping : record keet concept ,record keet task ,record keeping application type of record keeping .
- software .
- choosing a package.
-spreadsheets:
- spread sheet and database packau ,spread sheet package other spread sheet facitie and graphs spreadshtappli a..
Item loyal customer

te

- 32 explain: Educational the Mrs in time perspective.

Explain peadagogic and perspective history of Education development .
- orientation : Greek idea sophist concepts ,Socratic idea of knowledge the platonic concept ,Aristotelian idea on the infrastructure of Education ,the stoic Telos formula ,
- Roman idea , earthing Christianity ,media volbidea ,humanistt ide ,pedagy becomes ,pioneer of peadagogic founder of pedagt become science of historical original and development .
- methodology of the history of Education.: orientation field of reast nature of problem of research ,general methodict,post minded futt ,factuality individual b,open mind , Conte temporality , setting the regret methodology unrestrained complexity present and future ,nomothecity ..
+Professional competence personal enrichment.comparaison ,method approach,basic science method of investigation,them design field ,invesy of contemporary them , hypothesis formulation, investigation ,collecting data making , established information Education ,interprefinger data writing, approach for research, problem historical problem historical anthropology approach Mets bletic , history.
- explain : development of higher education in general.comment , concept higher education a time instituts history functioning ,modern ..
-explain college university criticism , justice.
- established ,some ..
- English education system ,control Education used ,aim content ,
- note ,the act preamble to the act ..some stipulation

Aspect of the provincial Education system :
- Education control , religious instruction,teaching medium .
- a natit Education dispensation coordination uniform in education matter , preliminary work for new Education dispensation ..
- policy keep with policy principles : change in some important Education matter , preliminary Education primary and secondary , division to schools course , the grouping of school , provincial Education ,
---
- 35 .explanation :General psychology low
- the identification of psychopedagogie two ,
-method of psychopedagogie test nationalism the experiemental testing the experiemental method the clinak methods, naturalism observations testing ,the functy of theory test verification , modification form of modern theory .

- explanation of behaviour reductions, explanation pattern , psychopedagogie influenced school of psychopedagogie present phylosophie
- motivation , : explain motivation questions acquired classifying working .

- biological energy recurring need measure activai stimulus transaction
- discrimination conditions: other classically conditions response , instrumental learning and operant conditioning..-
- reward and principal of reinforcement three learnings situation narration rewards non continouse extinction, stimulus generation learner reward negotivr reinforcement and motivation.
.-learning : selective discrimination learning ,trial and error multimensionaliry learning..
- motor skills learnings motor skills task distribution of , transfer of training feedbay knowledge.
- verbal learning : general procedure verbal rate presentation vfactor some interpretation in verbal learning transfer of learning concept..
-cognition memory:
Measurements of two factor of retention,short term memory information processing memory control language, development, hereditary some genetic principle .
- maturation: patterns of development maturation and experience.
- some devely topics : perceptual development language development of intelligence development of socisk .
- sociality interiors change communication society ..
- consumer psychology: attention getting methods effective of advy other aspects of , structure,purpose
Personal patter animal socisk manipulation social acquisition.
-motion : emotional in history analyse Lyman emotion physiology functionalite, facial expressions.
- acquisition emotional: limitations emotional conditions, learning developing and maturation of emotional,theory..
-psychologicsl stress: selyes ,systt stress psychological stress psychomat.
Perception : receptor function:vision audition ,faction and skin sense kinds,
- psychophysic : detectsbily low sublimation perceptions scaling ,.-
- organization's : reception audition faction the skin equilibrium.
- origin perception: development perception at distance visual depth movement perception,sound locaty colour perception colour their...
- subjective color after effect illusion.
- attention : matter orientation Tracy passive stimulation select.
-attentiin analyse : neurological attention negotivr didactt listening institute , attention brief stability.
- conditioning : the learning concept classical conditioning ,temporal relation extincty recovered higer order classical response .. motivation ..

_____&&_&&
- learning and memory at school in
Learning psychopedagogie persscpectuve perspectt components of the learning memory.
- model ,
- the affective level of the learning memory process sensory memory.
-the cognitive level of t learning memory process
Short term memory
-the normative level in the memory process long term memory
Long term memory epis and semantic memory why do pupils forget learnings .
- learning subject content school
-ainm ,learning model for subject content planning phase , planning and preparing subject content effective learn ,planing execution phase..

- step in the learnerinf process with reference to learning pattern level of drilling reinforcement and competency ,
-product phase ,level of proficiency,level of structure complex , monitoring the prodtphase.
- communication the teacher as the exponey Education in transition teacher communicayteach ,communicat process ,general process.
Communicator style noise ,
- Educationak medit for effective teaching media practice subject : teach computer in education class PC Education use for teaching
- learning purpose :.computer aide instruction single PC managed available and placement of teacher :
- social aspect of classroom practice
Communication classroom , emotional aspect authority flexibility.
- acknowledge of father people motional encounter ,transfer of value personal aspect distance.
- function of teacher task directed functionalite of the teacher the social emoy group .
- life orit: explanation competency life skill ,type of skill life orientation study research in respect.-
-role : of the the church in realisation the role society .
- the role of occupy life in the realisation of wath do emplot exception terrait planing for life skill trait.
- explain definition terrain delimitation,the desit of programmtfor skill training a primary or secondary,CVS develot ,life skill modej ,religit Education theory and lrat.
Agraindinf of the subjey ...-
- handling of pupils of :
Motional assisted..
- benefits the individual , orthopaedic they
_____
Explanation: teacing the practice of nursing a text nursing didactic th.

- nursing educst the phylosophie of nursing ,nursing educst .
-the scope of practice of a registered nurse .
- the scope of the role nurse.
- the scope of pratice of enrollment nurse .
- the independent and dependent of nurse ..the independent functy of nurse .
Phylosophie of nurse ...- the historical of nursing education outline ,:introduy , nights syst, amercain system ,conbtini.
- purpose : and object nursing education.: selected of Education object in nursing ,decide what student ,plan implementation plan , evaluation.
- authoritie responsible for providing education .
-regulatiin affecting nursi Education:
Regulation country council ,RSA ,training registration and enrollment ,types course a Aila le registration,
--_----------
Safety health aid tools hand ,,,.
Education safety health occupation,security. ,,
...

Explain: what is pedagy importance of pedagogy in teaching and learning process ,
- what is pedagogy,
- what is the pedagy in teaching,
- difference between a pedagogical approach pedagogical technical.
- type of peadagogic,
- role of pedagogie,
- pedagogie is method of teaching in theory pratical understanding student.
- pedagogie in teaching in refer educator student lead ,LMS , construction.
- teaching quality of teaching, encourage cooperation learn , eliminate mono learning.
- pedagical technique ,a pedagogical technique.
: defines a set of action performance by the teacher in the classe for teaching include flipped learn learning computational thing and stepped learning it is more granular Thant .
- technological pedagical content knowledge understand of how teaching learning can participate framework an education.
- technologiCal pedagogical content knowledge framework integrating knowledge record.
_____
- Engineering pedagogie educating ,focus if view of engineering pedagy is the development teaching concept creation for the preparation of further Engineering leadership roles changing .
- explain problem base learning TVET engineering electrical,

_____
- explain ,educare qualifications has been designed for people love work with children be able growth development child phrase ..

_____
-explanation psychotechnique ,: system of actor training preparatory Deve theatre practical test measurement large verbal numerique ,test permis, suspension, permit v. QI. = Quotient intellectual ,age mental /age chronological
. recruitment test suit logic.
Is used to determine the degree of extrave Ce emotional stability professionalism ,as employment,is concerned accord board dimensions psychopedagogie.

-_____
Psychometric test : the main goal of an aptitude test is to ensure that a candidate passes the amount of skill and cognitive ability to perform the duties of job role the common skill set measure test numerical verbal and non verbal rea
...

39.Explain: pratical school , orientation industrial trade
Pratical nated ,
- promote standardisation in trade and industry is one the objective of council ,CSIR
-orientation industrial in electrotechnology.standard industrial draw and label gate by EIC system gate output,,explain neer
. orientation industrial : in electrical trade theory ,domestic appliances: type machine washer , ,,- maintenance out replace element tasg ,replace ,stei pannej ,,
 - orientation industrial in plant operations theory ,chemestrt and chemical processing ,cellulose fibre material ,manonr,readrvcombustion fuel and thermal insuy,,transfer heat pump, mechanism , convection.
- orientation industrial advantage close cooperation compagny ,industry ,,
Functionalite supervisor control responsibility,the aspect to prevent is to teach workers not tact :teach work
Teach worker.

Discuss different between Education and training .. government instituts.
- a supervisor realise account organisation position direction tools ,,
- importance diRectiob stragie ,operationel ,,
- supervisor selection worker job tools need , employees training performance
- operator is need mechanical workshop machine operator for stocking material

- industrial orientation in trade electrical
Operator stock material orientation,
By protection ,heart, illumination.
Application , equation AC ,DC

-_____,_
-In dbe to isita project to teach workers
In dbe teaching worker training direction practice workshop dbe ..compagny corporation
City power Eskom : exam national DBE
...

Explanation , orientation industrial vs manage supervisor,vs management system information vs manage system information in education key challenge n
Career posting time table

counseling: trademarks industrial compagny trade theory license and trade pratical license.
Orientation industrial
Teach sork disciplinaire work communication skill team study team operational discipline teach counselor assessment and facilitate team value
Journal classwork average score
Counselor statement ,by psychometric goal work counselor conduct misconduct coursework engineering
Counselor engineering studies creation Portofolio assessment,and planing by ruling courtesy low common .
In dhet ,,in DBE workshop technologie
Counseling project by orientation checking low outcome workers project isita umalusi electrotech EIC commissioner in job experience
-Minister creation secret arrested ministerial letter appeal step. Minister dhet and DST building infrastructure government system careers creation authoritie building creation, counselor conductor, complain compliance duty
Orientation industrial guidelines project workplace disciplinaire, questions number of task

number job project marktrad licensed ,
-appeal release result irregularity,non accreditation school instituts research trade training to minister ucpd , development isita creating DST ,supplier profile , regulation,minister irregularity creating diploma technologie system DBE and recreating system backlog ista
Teach appeal low Education processing learn ,by abscent Clauseoffice ucpd record learner orientation ministers teaching students practice counseling orientation industrial and marking process presentation ucpd and DBE system was learn job in trainer training
.

- explain: isita project orientation industrial counseling experiemental

- pratical experiemental
irregularity assessment. back log ,,time table n4 ,,and time table n3 trade theory examination ..
Irregularite suspension 12month ,n4 rwiten final n6 ,n5 final examination,final soon n4 examin irregularity final
Examination assessment years academic final ,
-Level 5,6 framework qualifition letter no qualifications isita back log .
Irregularite: 12 additional information pratical process learner completed:
Management system information
Level 1,2,3,4,5 vocational principle police theory ,applied resolved
Orientation: principle
. information management system:
Pratical 12month ,18 month pratical subject pratical exam school .
Topics test n 6 ..
-in high Education subject assessment moderation project:
In dbe subject it orientation vocational guidance: outmark

DBE filing pratical Poe s
Isita project student make computer
Learning lecturer computer subject , orientation skill training computer system
- information system , :computer
- quest operating system ,display option control panel gives ,
- system tool data computer .
Option , change display ,system defragmentation display..
- uninstall program system programs feature ,, physical formatting Calle relative , ram room

cache memory ,folder created.
- Process of converting or data into prevention b, software , fraudulent vpratice email personal information ,infects .
- format pictures style drop ,use ,,spread is opened ,insert formulae
.- appropriate spread sheet v.
- appropriate functy determinat the price contract router ..
- computerised systeme
Create a news set of name select file compagny ,
- compagny parameter , business
- word processing : create services invoice ,use Arial 12 pt , all ..
- leave two line space , key ,,
- unit and replace word megabity ,save file A,,fibre ..

- irregularity,isita project back log record complain subject ..
Assessment mathematics:
-Orientation industrial and trade mathematics :teach workers ,trainer workers supervisor ,standard measure

-Management supervisor, :mathematics
Computer system management

-geometrical, algebraic ,limited , dervide function
Prove ,radius area high calculate approximate change in volume: V= π.r.r.h
-use partial fraction to calculate b..
-determind particular solutions integration.
- sketch the graphs of , the area bounded . determine the length of curve , equation,
- calculate surface the curve , x ,y is rotated

Engineering ,orientation industrial: engineering physics
T# compression :
Heat heeded to bring heater ,
Heat gained ,heat lost
- electrostatics:
Power = w/t the amount of energy .
- heat gained ,atom , frequently ,the energy of each ,,thermionic ,optical
---
- electrotechnical : DC : excitat motor control obtat adjust,
Alternates
- power developed,rotor output ,,
Power input = rotor output rotor .

Energy

Industrial electronics ,transient ,calcul value resistance to allow oscillation ,
Transducers : standard current ,step ..
- ultrasonic x - rays and radii activt: the energy can transmitted the energy genert high ,
- electronics safety device and electronics ,regulator system.
-thyristor device and scr speed .
-,programmable logic controller..

Pratical industrial in dhet high irregularity regulation material project ,,
Outmark ..
-
Counseling: project
In dbe project workshop counseling
Management supervisor workshop
engineering,isita record academic ucpd
Create diploma: certificate
Counseling industrial electronic electrotechnique mathematics ,in trade theory
electrical ,material irregularity DBE disciplinaire 11month suspension marking progress .appeal minister
Pratical,
action take occured irregularity and complain address ,, qualifications subject: 18 month technology guidence vocational module.

Explanation : career vocational science ,, explanation low Portofilio.
The police introduction
- section Career orientation profile,
-selection process ; choose career answers.
-question reward live leave , professional answers occupation.
-student guidance counseling police opportunity,, career understand job sleep skill , duty correlation,
- peace officer preami,duty assignment case involy policing ,salary career allowance, duties securite function compagny invesy,older private police no longer existed replacement ,in function ,police minim case senior college orientation profile,psychometric , polytropic test college Deb employ , task physical , deduction probation life insurance, professional, listening ,career ,profey a matter an amateur career ,Unifor report ,court syst , division Pre trial

paralegal ,,
- police officer entrance exam police measure the basic skill ,exN read word duty
-what is community oriented in policing range , innovation organisation police improve skill project build communy , procedure,practice , activities residents
...

Explanation: irregularity
Error test used for diffece between two independent sample satisfactory distributor performance:
-service ranking ×1 overall,raking difference ,d1=y1-y2.(Bid sum .d.d = s data analyse invest assot agreement irregularity and back log project trademarks nated in job ,step process respond , provisional tax payer and penalty , understand and late submission,file Portofilio education trade , ,maturity date Poe s social award student , coupon rate 14%,
 internet,tendered bid or submitting 12%, tendered assumed accepted ,(1009),I R 709 interested,pay + c / 100×d, 3609,c = rate interested order ,d= number of day , 60 day proceed,R,1000=(1000×17,49,, denomination acceptance capital emploie, capital reserve resent taxation total assets liabilities balance sheet,manufacture
-pat total retrenct , provided tax liability,salary and interest tax sum tax norm tax tax free portion award , provisional tax ,income salary overtime , allowance award irregularity plug ,equal renumeration leave,less acceptance of quotation irregularity and back log .

_____
40..Management administration industrial ,
- products maintence tpm

- H: rate of Quality products 98% ,ideal cycle time=0,8minute, f: actual processing time + j×g=0,8×400 t availability= s/c×100=400/600×100=87%
-(m: operating speed rde= I / jx 100+0,5×0,8×100=6,25%,,
- net operating rate = f/e ×100=(0,8×400)400×199+80%>
I: performance efficiency ,+ m×n .100 +×100=(0,8×4000+80%

-net operating rate = file + actual processing / operationek
-process amount × actual cycle to operating+ 400 item× 0,8 % availability,
Avat + operation time / loadshedding time day academic record and Pratical
-net ...
- time loading,400 Mon × 109+ workplace record accuracy,process running,planned down ,lost process ,time c- d ,, processing time ,, j×g operating time finished , external total, quantity processed ,total including losses memory , attander ,cycle , actually processing time

- time × idee cycle actual appears= 400 item × 0,8 Min /400,,
-ovarall ,,
- job schedule job , production planning and control schedule date issued , relaxation total,credit 0-4 Min work earned ,1080 per× 0,4+43 Min work Min available work of 100 performance ,432 Min ,, 432/432 days of work = 90 out ,100 performance,Orla ,% is over all relaxation allowance mode rate ..

B. Planned down time per day ,down time accounted for inhere proceed,
---
a.manning meeting +29 minute loading time per day.
A-B + 460 minute ,D ,stoppage loss per day ,break down,20 minute stop, 30 minute, adjustment -20 minute= 60 minute ,operating time per day
-C-D= 400 minute
,G
: output per day + 400 item file

<u>42-Duty industrial trade college and industrial ,</u>

- explanation ista project back log computer student make .
-document wallet project office , appointment documents access post ,
-docuy wallet registration form appointment office , register documents emplomy, information recruitment documents Wallpaper wallet information,database stationery documents wallet ,arch office ,office size mass .
- docuy wallet bank account ATM printer ,record book customer revie ,record registry I'd number system , documents wallet Portofilio job career ,
- database emploie system entry exhib ,
- emploie record trait job qualifications graduation training post advertised,
- I'd register for customer entry databy job post sale reward , programme logic control custy logiy system I'd programmation language database ..
- print I'd frame work student ,print I'd student information ,print I'd ,job duty post ,print task rosta ,price over time print labour ..

-explanation: to
-electronics digital analogic circuit:
input a,b gate yes = a.B
-storage : potentiometer coefficient resulted and reducing voltage integration by factor
(6/12(initial ,x= 6/12 chart capacitor input , output and gate
Inverter integral circuit dx/St,,6/4 ,13,,
Sum,integer,summat,difference,RLC
L.di/DT(R,,+2/c , integral..
-construction PC architecture design development: input unit yes mouse optical keyboard yes , card red,control unity memory RAM ,ROM yes output ,CRT didn't,CPU yes ,room ,yes I/o,year vertical ,8 bit 69 but ,64×#=655336,
-memkry systt.
-sequencw +3 yes ,0,25 yes ,a+b ,A,B rim ,
- row yes data ,yes gate output gate , transistor bibpolaire logic diagram ,static
RAM ,select ,supplies logic ,
- booleen algorithm program read ,yes memory register , printer charge plate ,electrosty digital input ,character ,source ,Lazer mirror ,module ,ribbon tape supply.
- data memory time yes,
-128 sector memoire ,564 bit sector,
input output devices microcomputer converter serial data , parallel decoding microspacev,ram 16×16 bineray yes
-disc label plastic with write ed inde hold,
- sectaire track ,2,255 but logic process read digital step motor,
-ns ram yes ,ram yes ,ROM yes ,CPU semie conductor yes ,hard dic driver yes ,external yes flopy disc ,data 150 km to 12m,typical machine
-3 bit /5bit/ secret,000A,/AAA@/ load AC ,oo#B/BBB
- 00/ load output /001,001/

-pc specifications format : Intel core 7 , external 975@,3,3ghz ,Intel ,DX58SO motherboard ,6GB,g skill trident DDR-200 channel gaineard ,GTx580 sponsored by vertex ,wD 320 GB ,data iu hard drive ,Intel core ,i7870 ,Gigabyte ,P55-UD6 ,LG flatro ,a essential up grade components AMD,procedure,chip choice the starting dusk x 2550BEb, CPU ,,X4 , 646 upward faster closely processor direct conflict shoe improvement load processor specific benchmark 3 d tendered video encoder x 264 ,,
- graphic upgrade ,new little graphic card up date gaming phenomenon power × 2550 choice graphic card filled card up grade ,sub R1,500 udger choice HD 5770bigger to jumping performance Dx ,10 gaming word in conflict ,
- platform up grade ,CPU u grade path for LGA ,775 socket mother PC 3Ghz,core ,3500 CPU ,4 GB of DDR,ram direct ,x9 tessellation performance heaven ,,2,5 / frame per second higher better ,base systeme with sapphire,HD 550/#7

- upgrade to HD 6959
-ditect ,x 9 gaming perfot..
-one the card edge graphic tracker #gb , sapphire 5850 Xtreme ,retailing R2000 ,price complain 6 pin power connector which PSU hard physical driver installed benchmark away result disappointed ,3 marks improvement word conflict did manage ,lost planet frame wallet being ,R2000 ligth completed reliable,
- battery ,g ram ,slot ,#gb,systy memory sticks R150 ,ram benchmark
-upgrading memory and processor GB ,test window ,CPU the HD ,
-weigth components for the perfect budgy building , perfect machine
Mother board F#A75-M-R1.100, processor A8-3859-R1,300,,
-ram ,corsair ,4 GB,,:1600mhz-R1000
-graphic ,xFx random:HD6670-R1000,
-storage : 750 GB - R 619, opacity ,re R200,PSU corsair ,430w ,R470, chassis : cm elite 343/, total :R5,369

Build test installation CPU Vital
- compot case layer CPU guard lockdown,add cooler and fan fixing bracket underneath ,screw holes fitting connect mbod,fit the ram : open the catch snai lock. Motheboymemory Chanel ,# and 3 operator,
 Hook connect ,2+4 pin connector to mobo ,the 8 pin EPs cable whichever,.
- test the company power that sucker uonturning , screwdriver,striking the balance corsair ,4 GB ,,1,600 MHz ,DDR3 ,liani ram share system,CPU gaming rate ,2,34 MHz ,and 1,600mhz case ,
- Pre the case bit ,atz mounting screws install the PSU ,bottoy cable module drop in mother remove CPU from mobo CPU
- test it still works connect cable case fab ,tech analysis:
2560×1600 screen Gami surplus frame ,R14,09 flashi ,CPU rendering performance.
- cindbonh ,R#1,

Test
...

44.Explanation:Technologie compagny:

Teasing compagny , requirements market technologie solutions customer product security surveillance network point ,

- mission : provide technology added value business provide quality products ,
- valeur accountability ,,.
- LCD monitor screen size ,22,5" , 6 viewable image size : 546,86 mm display area : 476.H,,,268,2,v).. mm brightness , typical : 300 CD/mm, contrast ,ratio (typical) 600000:1(DCR) response time (typically) 5 ms , viewing angles 170/169,max ,,
- resolution : 2920×1080@ ,60hz

-HDCP compatible ,yes ,input signal : analogy ,RGB ,,and user control menu entry image ration source up ,consumption power ,on < 49 standard < ,wall mounted ,visa 100 mm , mechanical function tilt ,5-29

- special features : touch key USB ,
- type Gori - 335 case type ,ATx Min ,case motherboard : micro ATX , external up (up to 13"×9,7),(p4ready)
- power supply: 400w Culp ,P/s with 22cm fan (20+4 pin socket ,775 ready,.,,5,25" drive bays : ,3,3,5" drive hidden , expansion slots: 7,I/O interfy USB × 3 mic ,1 spk ×2 cooling fans front ,80mm,×2,rear 80 mm×1, dimensions,(D×w×H): 410×182×425mm,M/t(cuft):1,73.
- print mount USB audio high green LCD fan external ,= 4,5,25" and ,3×3,5" internal driver bays ,4× 3,5" HD ,system board ATX form facty ,13"×20,5 expansion slots standard ATX material steel ,
- dimensions: 52,25×20×45 cm
- raid max modular cabling system durable , titanium mirror grade block wraps mesh cable to mention ,20 toal power connector for computer ,type ,ATX ,12 EPs ,22v maximum ,power ,fan ,135 m blue led ,PFC ,main connector ,
- rails PCI e connector ,2×6 pin ,,1×6+12 ,pin modular cabling support yes , energy efficiency ,up to 80 % ,over voltage ,
- network cable .

5 cabling : 500m,solid , 24 AWG,,0,5 mm ,pair ,grey ,305 m flex or solids ,to ,24 AWG,,05mm ,pair

,,cat 6 cable ,305 flex or solids uti,24 AWG ,0,57 mm ,4 pair Gray ..

- cable tester digital tester ,cat 5.
- toolkit ,j-059 long nose pliers (159,mm) by micro cutting pliers ,by ,339 cable blade trividr hyp ,5022 wire stripper , by 567 telephonic plier ,8 p8 ,/-45 punch down tape,2,mm knife , 539 soldering iron ,39 w cable tester tweezers ,125 mm ,crysty, tester , tweezers 225 mm , crystal, screwdriver,+- module plug RJ ,- 45 / 7 PC , PC plastt box ,315× 255×55mm ,crimping ,tool ,Rachel type dual crimping ,punch down tools ,walls boxry cat singltpart,45 key Stine jack , surface ,car 5 double ,RJ 45 jack ,carb ,
- connector ,boot sleever ,RJ45 cat micron connector , standard cable make female ,15 pin VGA,extenst available ,in 2,0 m ,,3.0,,m,5 / male 25 pin,,

- 1000VA/2000VA,rack mount ups,
- patch panel 24 port it cat ,5 a panel ,w,t back ,bar ,48 port cat ,5 panel ,,
- battery voltage ,24 VDC recharge ,8 hours to ,90% charger input voltage ,2# vac ,,
- or 220VA,, output,wave from pseudo,wave protection outshort city overload protection with current limiting protection ,659 VA line interactive ups ,auto restart recover , provide ovrlot protection size ligth,b microprost control ,proviy modem phone ,line surge protector optit , equipment input ,voltage , building DC start functionalite enable ups ,input commercial power range ,145 vac ,280vac,avr range ,265 vac , frequency ,59 ,z #0% ,, output commercial power, sine shared frequence AVR voltage , 229vac ,auto sensing transfered ,b gross weight ,6,2 ,size mm,D×w×H,,,, 260×96×135..
- data manufacture data security , securite technologie PC , undertaking ,self finger printing , maximum b,test winner , antivirus program,,engine ,anti spyware,antipising, systeme tuning, firewall,internet ,award technologie,double scan outbreak shield , integration block,file archive ,formal ,heurisy detectt of virus ,client security , manager server ,agent notbooj server memory ,, -
- Serie projector ,3 projection sysy ,3,LCD ,panel,2 lense projects , system ,resoloi was resolution..
_____&
,- adabase ,storage data, association, emploie..file edit mask array , more, systeme, session systeme, system data. Area program ,nucleus ,buffer pool / ,I/o
General,file control block field data space command is added , database,
Empl modification,leave ,,name ,title ,edit

-Triggered: gitlab,/ GitHub /azure

Issue test ..
-Triggered electronic elektor technologie
-Circuit microcontrol ,,
-Gitlab ,fail running
Issue kananga ,, Engineering tshingombe
Project ,commited contributing ,code source
...

Re:/ award diplomat certificate,markshet transcript letter experience theoretical practical engineering n studies outcome

Inbox

tshingombe fiston <tshingombefiston@gmail.com> May 29, 2024, 6:26 PM

-Address:postal.
-Francis bard Pretoria Department of Higher Education and Training

123 Francis Baard Street, Pretoria Central

Room 506_012 312 5440

To:St peace college and instituts, tvet Dhet
-Date :subject :completion letter :
Practice experimental log book.
_____

-1. To concerne
This letter serves confirm .Mr was participations in the work integrated learning programme of department : Dhet research assessment irregularity national examination nated n4 to additional information and workbased on visited circular practice external on line job work practice on department of energy minimal compagny career CVS and industrial portal council work city power day visited on line Facebook,Gmail badges,Eskom career day 28day appointment,sarb career engineering artisan electrical electronics engineering,Microsoft Scheiner career certificate training, Eaton electrical dtic day project engineering ,sasseta saps psira career mil engineering career metropolitan
,log back project isita DBE and participate assessment engineering electrical for n studies engineering n diploma national framework work qualifications NQF saqa subject research engineering electrical at St peace college 20days work ,circulum on line computer practice topics research engineering electrical at St peace college practice CVS computer aid .from 20 february 2022to 20 april 2024 in the area of engineering it expected following subjects.
-Computer and information management system in education learn engineering assessment police and safety 1,and engineering safety security.class orientation guidelines./technical documentation libraries engineering learn.
Outcome career subject entry irregularite time table revisit , irregularite career material illegal job material induction mentorship subject trading entry subject trade electrical theory , industrial electronics , mathematics, engineering,electrotechnic , industrial orientation science engineering drawing n1,n4,n3,n2,n5,n6,nstudie career experience exhibition electrician wiring panel,code ,generator power station transmission engineering subject irregularite
career policing subject detective , business studies career ,advance field research electrical career lecture asssessor senior trade theories lecture irregularite engineering trade , module

week material AC DC courent mesure instrument , exhibition career power station plant theory sum AC +DC machine +instrument measure to evaluate generator , transmission career job and advanced continued assessment framework qualifications compagny,summarise module subject math , engineering science draw .

-1.1Section one

_____

1.2 Assist in the capture /profiling of job application career portal log activities on line internet project data development engineer path azure GitHub Microsoft autocad Autodesk Microsoft -engineering design analyse.kheta advice national career ,investigation system visual studio development.ms office . engineering electrical automate programmation computing trade theory assessment subject time table allocation topics.enginering drawing n autocad topics relate nated Eaton assessment

2.typing of memos and minutes exam papers topics assessment self assessment draw sharp table engineering electrical planing.

1.2.design of reporting template: tableexcell ups engineering electrical software.

-management and training assessment panel wiring electrical

-assiste with headling career filing .

-capturing of career information system.database recruitment informers investigation electrical data source reports.career portal advices .

-sorting distribution files information management system Education irregularite database system Portofilio.

-allocated consultation and information record management system database assessment.engineering

-handing inquired admnise communication skill , orientation industrial design template attandance registration on line form visual basic ,excell ms word .

-relation labour handing of Portofilio survey interpretation status ..

-duty monitoring assessment moderator asssessor engineering electrical n studies and level irregularite material suspension transcript marksheet years .

Staff, daily staff delegation compilation of duty .

-monitor

-filing of retrieval of engineering assessment transcript record instituts saqa college topics project azure back log ..hrs practitioner..

_____

1.3.library and information service :sciebono career center and St peace college info class re rwiten

"Engineering science career" ,

-research process : reseach method plan and disc ,collected and collected capture analyse collaborate and create management store preserve share and publish assessment textbook

topic, monitoring and evaluation,emerging qualitative and quantitative missing text book engineering electrical.
-research methodology engineering electrical topics vs research triangle.qualitarive methods quantitative methods ethnographic participate observations studies depth description engineering communication source data engineering ethnographic r group, participate research involving esearch case studies engineering electrical,source.
-textual critical in social engineering,survey aim to provide overview,
-experimental design laboratory controlled conditions physic psychometric technical ,field natural experimental design ,aim to provide a board of a representative sample of large .
-secondary data analysis using existing data it aim.
-conceptual analyse meaning of ward or concept clarification theory buildings on role building studies,literature review studies .
-types of qualitative research design ground theory research narrative.hiatorical case studies and phenomenology design engineering field.
-grounded theory is systematic procedure of data analysis typically associated.phenological studies design engineering electrical,case study research advanced field,
-wath are research method in library data collection first is to choose a suitable methode for collecting primarily data depending reseach topics objectives methode interview observations and case subject..
-step of library research process identify and development topics do preliminary locate material evaluation make note ,rwiten papper ,import method for data collection ,survey quantitative interview library.
.<u>1.4.1.technical documentation in simple steps: business files and data during operation documents size store career control</u> access keeps record and analysis career outline engineering step on line save download day part time learning.
-consider a degree or certificate.
-develoo skill on experience.
-primairy :collecting record work clerk retrieved engineering career .
-cataligi g data files and digitalise create file documentation organisation job engineering research analysis thing .technical knowledge soft ward .help desk technician types customer service , responding to customer support inquiries and documents feedback from customers .Google it support rating .
-research faculty teach and learning research lab learning environment clinical simulation practice of simulation teach to develop outcome student team work communication self assessment, simulation base education la assessment,task training task oriented , simulation lab ,booking Education technologie, engineering science career electrical module engineering board

-work purpose lab work conduct of experience,prepare work ,note book, of log book prepare

rwiten engineering general format engineering, introduction theory procedure methode ,result vocational career trading guidelines.

_____

2. Section two.

Department energy mineralogie compagni ,Eskom
-related minimum experience.
Technical experience and engineering related technologies, skill and competencies leader .
-knowledge: relate technologie design codes and standards , engineering theory relevant processes ,police guidelines and legislation engineering design.
-technical problem solving co technical cost analysis presentation.
Key responsibilities , resolve complex integrated engineering problem variations integrate life cycle plan for .
Provide special engineering,advice assistant manager engineering projects modification.perform technical and financial evaluation

-Power Serie books on line research team future of power engineering lie experience engineering. Topics
Application post :28days booking confirmation shared successful or unsuccessful.plant generation substation power station transmission metering post megawatts financial .

-planing design construction of overhead power line principle system planning .insulation .
_fundamental and practice of overhead line maintence . theory of overhead line management topics , implementation of work sole inspection
-practical guide to outdoor council engineering high voltage characteristics electrical test specific flowchart inspector.
-theory design maintence and life management of power transformer,theory principle and practices of design , fabrication overhead power line structure of towers moves and diagrams.
-power line tower one testing .
-transmission theory design and performance role ,in electrical design ,AC DC, ,hybrid,loss may , economic DC line conductor , conductor charge .
-thermodynamic for students practicing engineering under thermo essential for power plant design and volume , outline key thermodynamics,
Princit steam and plant compressor refrigeration plant entropy engineering to design thermal fluid machine theory to plant operating and new design is
-applied system dynamics with south Africa case studies system methodology for studies manàge change over relief respect flow accumulation material control the flow industrial.

-practionner and sustainable mentorship and coaching book

- 2.2 .purpose career explanation : course customers training manufacture execution scheineder electric PLC introduction to PLC level 1, ecostruxure control exper programming level 2,intermediate introduction machine ,ecostruxure process expert hybrid process, supervisor control 2data acquisition software configuration workspace situation , network connectivity control ethernet io ,human machine HMI programmation, telemetry truo licensed radio remote connect ,
-motore control introduction to variable drives altivart process system ,low voltage electrical distribution l.v.e.d ,SPD ,surge protection device ,on demand.
-low voltage low voltage distribution l.v.e SPD ,medium voltage permet set , medium voltage electrical distribution m.v.e, electrical novice ,
Ecostruxure power monitor expert power monitor project deployment
-explanation diagram: note technical
(Ups stream) , yes (USC %) ,=yes HV (transformer rating)=yes ,(power factor coincidence duty factor fore seable expense),(yes load rating).
(Conductor charabke ,busbars,length, width, thickness,cables, type insulation, single core, length,cross section, environment,ambient temperature, installation method,number of,) Yes,,(ISc at transformer terminal)yes ,,ISC LV switchboard out goes)yes : (ISC switch board outage ,yes head of final switchboard yes),ISC end final), (breaking capacity,) yes(SST and install trip sitting yes) ,(breaking capacity yes , St and strip ,(breaking capacity St ms, final .
-explanation: calculation impedance of power source the up streav network the power supply transformers as well as of the electrical lines
Problem consider a 20kv network that supplies a HV / LV substation via 2 m overhead line and MVA generator that supplies in parallel the busbare of the same substation two 1000kva parallel connected transformers euply the LV,busbar which in turn supply 29out gears to 20 motor including the one supplying motor .all motor are rate 50kw all connections cable are identical and all motor are running when the fault occurs the isc3a d up value must be calculated at the variouse fault location indicated in the network diagram.
-point A on the HV busbars with a negligible impedance.
-point B on the LV busbar,at a distance of meter from the transformer.
-Point c on the busbar of an LV su distribution board .

-point D at the terminal of motor Mthen the reverse current of the motor must be calculated at C and B .
up then D ,A

_____

Upstream network
U1=20Kv, SCC=500MVA , overhead line,3 cable ,50mm , copper length=20km,
2). Generator, 1MVA ,xsub =15%,t
3) transformer , 1000KVA secondary winding 237/410 ,USC=5%
-mIn LV switchboard 3 bars ,400mm sqr /ph copper , length=10m,
-cable @,3 single core cable 400mm aluminium spaced laid flat length =80m,
-Lv sub -distri utilisation board neglected the length of the busbar,
-cable ,3 single core cable 35 mm sqr copper 3,phase length=30m ,
-motore

Drawing 1.

Reactance x and resistance are calculated with respective voltage in the installation relative impedance
-solution :

Section. |Calculation. |. Result x,R

20KV
1.upstream network|Zup=(29×10 exp3)exp2×10 exp 6.(1)
Xup=9,97 zup (2)
. | X(ohm) (R(ohm)
Rup=0,2zup env 0,2 xup
X=0,78 ohm
R=0,15 ohm

2.over head line |XCo=0,4×2 (7)
|RCo=0.018×2000÷50
X=o.8.
R=0,15ohm

3.generator | XG=15÷100×(20×10exp)÷100.

-RG=0,1XG

20KV fault A. X(m.ohm) R(m ohm)

4.transformer | Zt=1/2×5/100×410 exp2/19 exp
Zt on LV side | XT ~ZT.
Rt~ 9,2

410v

5.circuit break | . Xcb =0,15 ,15 ,,0,15

6.busbars one busbars | xB=0,15×10 exp -3 ×10
X=4,2, and R°0,84

RB=0,023×10÷400..
One 400mm .sqr bar
X=1,5 m ohm
R=0,5

Fault B
7.circuit breaker | xcb=0,15
R=0,15

8.cable.1
One 409 mm cable
Per phase |xc1=0,15×10 exp -3×80 |
Rc2 = 9,923×30÷35....,,

Fault c
9.circuit break ,xcb=0,15.....

Fault D
11motor 50kw |xm=25÷10×410 exp2/5010.9×0,8)×10 exp ,3
RM=0,2 xm

Impedance calculation : fault at A(HV busbars is to the generation
XA=0,78+0,8~1,58 ohm
RA=0,15+0,72~,0,80,
ZA=√RA.RA+XA XA~1,89 ohm
IA =20×10 exp 3 ÷√3×1,80~6,415

Peak asymmetrical ipA, RA÷XA=0,55,,K=1,2
IPA=1,2×√2×6,415=10,887A.

Fault at B LV base (1,2,3)+(4,5,6)×R,,97 motor .
(410÷20,000) Exp 2=9,42.10.exp -3
XB=[(XA.0.42)+4,2+0,15+15]×10exp -3
XB=6,51 m.ohm and RB=[(RA.0,42)+(0.84+0,57]× 10.exp -3
RB=1,77 m.ohm
- fault D motor (1,2,3)+(4,5,6)+(7,8)+
XD=(XC+015+2,7)×10 exp -3=21,52m
RD=(RC+19,2)×10 exp -3=28.2 m.ohm
RD=(RC+19.2)×10 exp -3 =
ZD=√+RD.Rd)+(Xd.xd) =35,5m ohm
I'd=410÷√3×35,5× 10 .exp -3 ~ 6,700A
RD÷XD=1,31 ,, K~ 1,04
104×√2×6,700~9,9000A
XM=(605+2,7)×10.exp-3~ 140 ohm ,ZM = 624 m .
IM=410÷√3×624 ×10 exp -3 ~,379A
20 motor ,IMC =7,589 A

-ZB=√(RB.RB)+(XB.X.B=6.75m ohm
IB=410/√3×6.75×10 .exp-3=35,070A.
RB/XB=0,27
XC=(XB+0,15+12)×10 exp -3=34,7mohm
RMD=(140/19+19,3)×10 exp -3~26,m
ZMD=43.8m.ohm
IMD=√410/√3×438×10.exp 3=5400A.
6,700+5,400=12,100A en and iPad ~ ,18,450A.

Symmetrical, method 3phase network is unbalanced, magnetic cyclical impedance no longer , voltage
-positive sequence , negative sequence.
I3,I2,I1 ,we vector geometric construction. Labell

-Fault estimated,
7,440×410/20×10 exp 3=152,5A
Rough calculation.D
Sum x = 4,2+1,5+12=17,7 mohm ,=xD
Sum .R=7,2+19,3=26,5m ohm .
Z'D=√(R'D.RD)+(x'd.xd)
The peak iPad
√2×7,430~10,500A.

Peak asymmetrical 4.8 time their rated current of 98A: 10,500+(4.8×98×√2×20)=23,800A.
-G=e. exp j.2π/3=1/2+j.√3/2.betwen ,I1,I2,I4,..
I2=a.a.I1+aI1+I1
I1=I1+a.I1(2)+I1(0)
I2=a.a.I1.(1)+a.I1(2)+(I1)
.. calculation IEC , 60909>550kv.,
UN./√3fault

Type.of short circuit|

General situation
||fault occure
-3phase .I|||ik3=x.un/√3.|z1)
Zk°√Rk.k+xk.xk. |. I''k3=C.un/√3|z1.
-Ze.=©©|Ik"=c.un/|Z1+Z2|| Ik"=c.un√3. 2|Z1|

Phase to earth Zsc phase o |Ikez=CUn√3|Z1|÷z1.z2+z2.zo+z1.z2.
- Ik2el2=Cub|Zo-aZ(1)÷Z1.Z2+Z2.Ze+Z1.Zo.
Ik2EL2=C in |zo÷z1|-a ÷Z(1)+2Zo
-_____
UnQ=20kv
IkQ=10kA.
T(St.
Cable In.,4m, in =400v,
Sr=400KVA
Ur THv=20kv.
Urkv=4%
Pkrt=4,6kw,
R(o)T/Et=

Problem network supplies transformation, Ik" peak short circuit,I=4m , 3×185mm,sqr Al
ZL=(0,208+Jo,o68) ohm .km
R(o)L=4.23, X(o)L=1,2.

Solutions fault at F1, impedance of supply network (LV.)
ZQt=CQ.UnQ÷√3.I".kQ×(ur.TLC÷urtHv)exp 2=1.1×20÷√3×10×(0,41÷20)exp 2= 0,534.

Problem power station unity
Stag=250 MVA,,,UrG=21kv ,RG=0,0025 ohm
X"d=17%, XD sat =200%, cos alpha , ,art ,= 250MVA,,
UrTHV÷Ukr=240Kv÷21kv,= ukr =15%,

Impedance generator ,
X"d=x"d÷100×U.U.r.G÷srG=17÷100×21×21÷250=0,2999ohm
ZG=RG+jx'd=0,0025+j0,2999
|ZG|=0,2999 ohm
Srg> 100MVA, RGf =0,005x"d,ZGf=0,0015+j0,2999
KS=UnQ.UnQ÷UrG.UrG ×Ur.Ur×tLv÷ur×thv×Cmax÷2+|x"d-xt|sin alpha
ZS=ks×(t.r×tr.ZG+Zthv)=
0,913(240÷21)exp 2×(0,0025+j0,2999+(0,479+j34,555)
ZS=0,75+j67,313
Zsf=2,226+j67,313
I'm"s=CUnQ÷√3Zs=1,1×220÷√3(0,73+j67,313=0,023-j2,07s,
|Is|=2,08KA
Solutions.
Tree phase fault at F1.
-impedan e of transformer
ZTHV=Ukr÷100×urTHV÷srt=15÷100×240×240÷250=34,56
RTHV=PkrT×Ur.Ur×thv÷srt=15÷100×240×240÷250=0,479
XThv=√z.zthv-rthv.rthv=34,557 ohm.
ZThv=(0,479+j34,557)

<u>-3.section 4 .</u>
<u>Purpose :</u>
<u>Power explain hand book</u>
-basic network analysis /and advance field college. University explanation career

-instrumentation ,
-DC motor and generator ,
-transformers ,
-three -phase induction motor.
-single phase motors
-synchronouse machine.
-generation of electric power.
-Ovehead transmission lines on under ground cables .
-stationery batteries.
-electric energy economic method ,
-ligthing design.

Label drawing resistor groups

- explanation : serie -parallele DC circuit to be analysed:.
Combine all Serie Req=R1+R2+R3+...+En
DE=RB+R14=200+40=240 ohm ,Req, GG=
R7+R8=200+400=600 .ohm , Req ,=, R10+R11==400R.=//.
Req=R1//R2=R1.R2/R1+R2)
G.G=R5//R6=(1009×1500)/1000+500)=600 ohm.
Sum VD, E=VAB+VBC+VDE+VEF
460=60+100+50+120+130v
-computw the current ,V1=VAB+I1.R1, VBC =V2=V3,
VCF=E-(VAB+VBc)=460-(60+100)=30
IA=IT[RB/(RA+RB),
IB=IT[RA/RA+RB, ..
I5+I6=0,5/2=0,55=I5=0,25×(1500/2500)
____---
Explain draw Motor source
-Id = Q c |VC|=1220 VAR (120v)=12
(0+j10,2).@ motor)=cos exp -1)×0,7=45.6
IM= 114.29 /_45.6 °=(10-j.10,2)
IT=IM+IC=(10-j10.2)+(0+j10,2)=10/_0°
100 percent factor capacitor installed in switched bank to provide a range of of correction
(S=P/cos)Teta=1200/0,7=1714.
S/|E|=(1714VA)(120V)=1429.
|.I| ×cos @=(1429A)(0,7)=10A.
QL=|E|I|.√1-cos.xos /_, reactive power factor ,
QL=(120)×(14,29).√1-(0,7)×(0,7)=1714×√o,51=1224 VAR

-Xc=VC.vc/Qc=(120)×(120/1224=11,76
C=1/wxc=1/(377)+1176=225,5

Purpose Explanation :Analysis of offset wave
Calculation average V avg= Vdx=T
T= period ,V avg =Vdx=[(12×1)-(8×1)]=2v
Vrm,v = √area[VT.t]/T=√(12×1) exo+(8×1) exp 2÷2=√104=10.2

-superposition theorem effect 20vdc, VC reached it final ,(steady-state) value
I=9,VR=I×R=0V,VC=20v ,effect of AC voltage (10.sin 377t) circuit ,XC =1/CW
=1/(377)(660×10 exp 6)=4 ohm ,Z=3-j4=5/_-53°
I=E÷Z=(0,707)(10)/_0°/5, /_-53°=1,414/_+53A
I'm=1,414/0,707=2A,
I=0+2sub(377+53°)
VR=I/R=(1,414/_53°)(3/_0°)=4,242/_53°
VR=0+6sin(377+53°)
VC=5.656/0,707=8. /_-37°, VC=5,656/0,07=8v
VC=20+8 sin (377t-37°)
V=√vdc .vdc +(vm1.vm1+....VM.vm)÷2
VM=|T|=√0.0+2.2=1441, |car|=√0.0+6.6/2=2,24
P=I.I×R=(1.414) exp 2×(3)=6v

-Explanation :
VR, 20 v , 10 sin 377t, c=660
W=2.π .f=(2)(3,1416)(60)=377.rad/s,,xL=1/(376)+26,5)×10 exp - 6
Z=R+j(xL-xc)=R+jxEQ,, XEq=xL-xc
Z=√R.R+XEq /_ tan exp -1(XEq/R=|z|/-0,,Z=100+j(188,5-109)=
√(100)(100)+(85,5(85,5)/100=133,5/_41,5°
-E= VR+jvl-jv =VR+JVC,,vx=vl-vc

Label drawing

-Explanation series parallel,RLC Serie parall Serie El,and RC ,,Z1,Z2
-I1=E/Zeq=100/_0° ÷1290/_224°=0,0775/_-22,°
Current rule I2=I1.Z3(Z2+Z3)=(0,0775/_-22,4°)
(100/$-36,9°)÷[500+j1200)+(800-j600)]=0,051/_-841°A,I3=I1Z2(Z2+Z3)=
(0,00775/_-22,4°)(1300÷67,4°)÷(500+j1200)(800-j600)]=0,0709/_202°

-Explanation.source =E=100v/_0°, load 1 ,P=200w,Qc=500v,, parallel load
2,pp=500w,QL=1200v,,

Triangle
Qxc=QL-QC=1200-500=700
S=√PT.PT+Qx.Qx=√700×700+700×700=
989,8

- explained maximum power transfer in AC circuit
Label series , source E 9v/_0°< pallele Z1=10/_53°,Z2=8/$90°,ZL
Statement of the maximum power apply thevenin circuit
ZThv=Z1.Z2(Z1+Z2)=(10/_-53°)(8/_90°÷(8/_90°)÷[6-j8)(j8)=13,3/_-37°ohn
ZThv=10,6+j8 ohm
R=10,6 ohm, xl=8 ohm ,ZL , 133/_-37°=10,6 ohm ,j8 ohm ,RL=106 ohm , ,XC=-8 ohm
ETH=EZ2(Z1+Z2)=(90/_0°)(8/_90°÷[(6-j8)+j8]=12/_90°v
Pmax=|ETh.ETh|÷4RL
Pmax =(12)(12)π(4)(10,6)=3,4w

Explain of a balanced wyE ,wyE system
VAn=120/$0°,V, Vbn=120/_-120°
Vcn=120/120°,ZA==zb=zc=12/$0°
IA=Van/ZA=120/0°,÷/_0°=10/_0°
IB=vbn÷zb=120/_-120°÷12/0°
IN=10/_0°+10/-120°+10/120°=0A
-analyse system balance ,
VAC =200/_0°, VBa,,200/_120°, VBc = 200/_120°, Zac=ZBA=zCB=4/_0°

Drawing diagram start start load source ..
Load current.
IAC= Vac÷zac=200/_0°4/_0°=50/_0°A
IBA=VBA/zBA=200/_120°/4/_0°
50/_120°A÷4/_0°=59/_-120°A
-solve line current
50/_120°=25+j43,3, Icb=50/_-120°
=25-j43,3)loS ,IA=Iac-I a
=(50+Jo)-(25+j43,3)=86,6/_43,3)-(-25-j43,3)=86,6/_-30°,A,IB=IB
IC=(-25+j43,3)-(-25-j433)=86,6/_-90°
-Ic=Icb-Iac=(-25-j43,3)-(50+Jo)=86,6/$-150° ..
_____
3..Drawing label balance, delta,

3.1Explanation: instrument correct transformer line.

3.2 Explain : instrument connect transformer line
A,b,c to 3 p AC ,, RF=10k,R1=20k, Ref=10k,

. drawing labell

2×11×60=1320 ,u. Sec
RC=1/2×P1×RaC
11×60=660hz
C=2,411×E-8farad,
--_____
I=P(V×pf)=20,000/240×80)=104A,
1000,000/2400=41A,
50:5A rating,
Select potential ,2400V, step down ,120V, 20:1,connected 2400,
---
Drawing

Select current : 1500,00/1,73×1200)=72
-line -to-line ,12000V, 12000/120=100:1
_____
Vare enter selected varent ,
I line =300000(1,73×8300)=208A,,
25:5_-A
8300/1,73=4790,
4799/120=39,9A
-scale meter :
Teta ,cos exp-1,,0,8=36.9°
Reactive power=300.00×sin36,9°=300,000×0,6=180,000var

3.3 Explanation Metering internal wiring

-
Connecting a tree phase watthour ,meter with a demand register to power line ,
Drawing.
_____
Union College engineering emeritus

34Explanation DC motor and generator :
a=4, four pole ,lap wound machine constant k=N.p/aπ, N = 780/2 ,=39,
P=4 ,poles ,a=4, (390)(4)/(4π)=124,14,,k=124,14
-calculate the induced voltage function.
EA=, =k×flux×w×m×s,
Finding , 2/0,0397=35,2 rad / v.s
Calibration > EA/w.m=k.flux ,
(124,14)(0,32×10- exp 3 wb)=0,0397

3.4.1.explanation :calculate the speed calibration of the the voltmeter: EA/wm ,,
I/0,0397=25,2 rad / ,IV ,speed of 25,2 rad /s ,2 π rad , calibration , 25,2/2π,,um /s ,I-
V ,,,(r/s)(60/SM)
240 tr/Min
Draw labell
Field load
Terminal voltage ,V t=Ra-ILRa=260,8-(40A)(0,4) ohm=2449

-armature induced voltage
EA = 280v , at 1100r/Min ,
ea =(280)(950/1100)=242V
VT=EA=Is(Ra+Rs)=242V-(630)(0,02+0,0045 ohm =224,7
- explain moment inertia j
T= k2wo, k2=T/wo
{(2.40nm)/(183rad/s)=0,013
Tacc=j/DW/DT, k2Wo=jdw/St.
Integral x1=84 ,X2=0 dr= (j/k2). Integral , x 1=42 , X2=183 (I/w) dw
[t] ,84 to 0 = (j / 0,0013) (ln w) | 42, to 182
-j=(84)(0,013)/(ln42-ln183)=0,742 kg
-explanation calculation the time form dynamic breaking electromagnetic torque=K1.Ia,
IA=EA/(Ra+Rbr).k2w+k1.k1 ×w/5.29
Or,St=(5,29jdw)/(5,29k2w+k1.k2)
t=4,355

Drawing label

-three phase scr drive for DC , scr calculation average values, equation ,Vag= (3×√3/2π)×V×cos s
V=(440/√3)√2=359,3V
S=40°,s Bag=0,827×cos,s=(0,827)(359.3)cos alph90°=227,6
S=45°, bag =(0,827)(359,3)(cos45°)=210,1
-conversion = 1100r/Min (πrd).m
60s=115,2
Const torque ,
- explanat ion
Calculate torque ,T=K×Ia,
(10hp)(746w/HP)/1208=35,9A
T=(33,00/0,738Lb,ft=64 7 n
K=I/Is=64,7N, m/35,9A)= ,1,8n.m/A
-ea=kwm, EA =(1,8V are)(115,2rad)
=208v,,EA=VT=Ia.Ra
IA=(2276,6-208)/0,42=46,
.T=k.Ia, 40°, T=(1,8Nm/A)(46,7a)
84,1Nm.,, 45° Fring an ,T=(1.8Nm/A)(5.0A)=9.N.m

Analysis of a transformer connected to loan.
3.5-explanation calculation moment inertia ,
T=
Armature=, poles
(0,75)×(12,4Ia)=9,3 armature field current IL=(0,048)(41,7A)=2,0A
R shunt field , RF = V1/If=240/2.0A=120
IA=IL+If=41,7A+2.0A=43,7A
IA.Ra=(0,0061)/(240v)=14,64V, Is =43,7
RA=14,64v/437A=0,335
_____
Full load IL motor ,IL = 5000w/240V=208
EA=Vf-Ra Is=240-(1.100ohm)(1.8A)=238V.
-pro(loss)=EA.ia=(238)(1,8)=428,42
IL+If,, VT=240,,V=ea-Ra(IL+If)
-starting
IA=IL-If=20A-5,2A=14,8A
Induced ,EA=V.t-Ia(Ra+Rat)=240
-(14,8A)(0,330 ohm+6,57 ohm)=137,9 V,
-test stat restricted
RST=(vt-ea)/Ia-Ra=
(240v-137,9v)/34.8A-0,330ohm=2,60 ohm

-ea= VT -Ia(Ra+RST)=240v-(14,8A)<0,330), 2,60=196,6
Rst2=(vt-ea)/Ia-Ra=240V-(14,8A)(0,330+0,917)=221,5
R1=Rst2=09,97.;; R2=Rst-rst2=260-0,917
=16,83 ohm ,, R3=Rst-Rsti
=6,57 ohm - 2,60 = 3.9
_explain , dynamic breaking for separe excited motor
T=33,00/P/2πn..
P= rating , n= speed ,T=(33,000).(7,5hp)
(2π×1750 tr/Min)= 22.Lb
1N.m /0,738Lb.ft=30,5 N.m

_____

Ia-Ia×.Ia .×Ra....Vt-2v
Calculation rotational losses rate speed ,.calculate initial break
2×3,5 N.m-2,40N, m=58,6
Torq=K1.Ia,,K 1=, I a = 240 m/.1,85=1,3

...

<u>3.6Explain:calculate a procedure,.</u>
-computw the number of primary and secondary turn ,
-N1=V1/V turn =2500/2,5V turn , =1000turn , similarly,n=v2,250/2,5 , turn ,
a=N1/N2=, 1000/100=,10:1
I1=(VA)/V1=25000VA/25000,V=10A,,I2=(VA)/V3,=25,00Va. /250
=100A,, I/a=I'm/I3,=10A/100A=1:10

Drawing labell: I1,,I2 ,zth =5k , Z1,, N 2,, ZL=8ohm,,
Thevenin , impedance.

Z1..5000ohm,, thevenin ZL
8.ohm ,a= √Z1/ZL=√5000 ÷8=25
,,25:1.
-a2= V1/V2=2000÷1000=2÷1, a 3 =V1÷V3,
2000÷500 V =4÷1.
-primairy ,I1,,, I2=V2/Z2..
I3=V3/Z3,,, I 2= 1000V÷500=20A,,, I 3= 5000V/50=10A.

-labell transfo , primary :V=20000,Z1,N1,, N2, N3, v2 = 1000, load Z 2=, 50 ohm ,,Z 3= 50 ohm

N1.I1=N2.I2+N3.I3,,solv.
I1=(N2/N1)I2+(N3/N1)I2,
N2/N1=1/a2,, N3/N1=I/a3.
I1=U2.Ia2+I3.Ia3=(20A(1/2)+(10A)(1/4)=12,5A
-
KVA = V1.I/1000=(2000V)(12,5A)/1000
=25kva , KVA ,= V2.I2/1000
=(1000V)(20A)/1000=20KVA,
KVA3=V3.I3/100=(500V)(10A)
.apparent ,25KVA =(20+5),KVA
-impedan e wind
Z1=a2.a2Z3||a3.a3.a3Z3,   Z 2=(2)(2)(50)||
(4.4)(50 ohm)=200||800=160 ohm
Z1 found in step
Z1= V1/I1=2000V/12,5=160

-power requirements:
P1=P2+P3+.... Secondly ,
P1=5+2+10-3=20w
P1=V1.V1÷Z1,,
V1=√P1×Z1=√20×2000.=200v
V2=√5×6=5,48, V3=√2×2×8=4V
V4=√10×16=12,7v, V5=√3×500=38,7ohm
a=V1/V2=200/5.48=36,51
a3=V1/V3=200/4=50:1, a = V1..

3.4 Explain, circuit , Z 1= V1 200 , circuit ,Z2=6 ohm ,p= 5 w,Z2= 8 ohm ,z 4 =, 10,Z5= 500,,
-I 1 ,v 1= 4800v,S1=100,f=60hz,
-I 2 ,n 2 , 609 v load ,S2=,50kva

N3,480v, load ,S3=50kva

a2=V1/v2=N1/n2=4800/600=8:1
N2=N1/a2=800/8=100tirb
a3=V1/V3=N1/N3=4800/480=10:1
N3=N1/a3=800/10=80 turn
I1=(VA)1,/V=1000000/4800=20,83
I2=(Va)/v2=80000/500=83,8
I3=(vA)/V3=50000/480=104,2

Performance and analysis of transformer with a logging
Diagram phasor
R1=0,3 ohm ,x1=15, I 2,N1, X2=0,015
I1, RC,XM , v2,E2, load
-E1,I flux ,lag ,E 1,90°,power factor,R1/a.a,,x1/a a, Req=R1/a.a+R2.
Xeq2=x1/a.a+X2..
Zeq=Req+(jxEQ. jxeq)
a=V1/v2= 2400/240=10:1
Xeq2=(R1.|a.a+R2)+j(x1|a.a+X2)
=(0,3/100-0,003)+J(1,5/100+0,00)=0,03059/_78.69°>
|I2|=(vA)/V2=100.00/240=416,67
I2=416,67/_-36,87°
V1/a=V2+I2.Zeq2=
(416,67/_-36,87°)(0,03059/_78,69=249,69/_1,952°
|V1|=a|V1|a|=10×249.65=2496,5

3.7-explanation loss calculation.
10kva , transformer, 40w iron low ,160-w copper loss at full load efficient 5kva,80%
Pcu,=I1.I1.R1+I2.I2.R2.
Eff= pour/pin = pour/(pour+losses
=Pour/(pour+pin+pcu
=(Va load)(Of)[Va load)
Of+of+pxu ,(Va load) n rating
Efficient=5000×o,8)(500×0,8+40+16)
(5000/10000 ,exp 2)=0,98
-level max efficient
Pcu (KVA/ kV rating,
Efficiency= p out (pour+pi+pcu) = 5000(5000+40+40)94
All day efficient , 24h trans.
Loss is a total ,P.t

(180×24)/1000=4,32kw,
W cubtotal ,(1×1×620×8+0,5×0,5×620×5+0,25×0,25×620×7)/1000=6,006kw,,20h
-wloss=50×8+50×1/2.5+50×@/4×7=612,5kw.
----------_--------
Explain draw
Generator ,I1p connection l1
and l2 ,13kv, primary, secondary 138kv , ,load rated =50Mww,,delta start ,x1,n1

a=N1/N2=13.000/79,677=0,163,.I1s=a.I1.p√3=(0,163÷2221/√3=209...
Load { total KVA /√3=80kva/√3=46,2Kv
-46,2kva/40kva×100%=115,5%
=√3×40=69,3
=69,9kva/120kva,x100=57,7
----------+
Delta Delta connection,80 kV /√3=26,67kva,load ,=KVA,
= 46,2kva/26,67kva×100=173,2%

----------_
3.6 Explain phase induction motor ,
I1,r,1x 1, RC,XM ,E 1, v,1, i2,X2, E2,R2/s.
equivenlent diagram
Solutions.
1.fulk load shaft power = 15×746=,11,190 w mechanical power development (pm)=,shaft power friction ,I1,R1,X1, RC ,XM, I'2-I2/a,x'2=a.a,X2,R',R'2/s(1-s), R'2/s=a.aR2/s
Pm=11,190+820=12,010w.
2synchrouna speed (Na)=f/p,
Ns=60/2=30×60=1800 r/Min
Slip(s)=(ns-n)/Na
S=(1809-1710)÷1800=0,05
Air gap power (page)=Pm÷(1-s)
Pafg=12,010/(1-0,05)=12,642.
-rotor copper loss (pcu.pcu)=SPG
Pcu 2=0,05×12642,1=632,1
-no load test f=60hz,V=229,9,v =6,36A,P=5/2w,
-locked rotor test F1=15hz,v=24,I=24,06,P=721w,
-locked rotor test at f1=60hz,
I=110A,P=27,225w
Aveg,wind resis stator terminal=0,42ogm
No load test
|Znl|=VNl÷√3.INL=229,9/(1,73×6,36)=20,87 ohm

Rnl=Pnl/3nl=512/(3×6,35 exp 2)=4,22 ohm
Znl=√|znl| exp 2-Rc .exp #=√2a,86. Exp #-4.22 exp 2=20,44 ohm
Lock rotor test ,
Zin=V÷√3.I=24÷(1.732×24.06)=0,576 ohm
-R1+R'2=P÷3.I.I=721÷(3×24.06.exp 2)=0,415 ohm
X1=X'2=√zin.exp 2-(R1+R'2)exp 2
=√0,576 exp 2-0,415 .exp 2=0,404 ohm
To determine leakage ,60hz,
XL=(60÷15)(x'1+x'2)=60/15×o,403=1,616ohm
X1=0.3xl=0.3x1.616=0.485 ohm
X2=0.7xL=0.7xL=0.7×1.616=1.319ohm
. magnetic react
XM=Xnl-x1=20.44-0,485=19,955 ohm ,
PG=pnl-3.i.R1=27,225-3×110 exp × o,21= ,=19,602 w

3.7 Explanation:
-3÷188,5×(241,2)(241,2)×0,2÷1=185,2Nm
-R2'/S=0,2/0,0333=6,01ohm,
Z1=(0,25+j0,15)+(j30)(6,01+j0,5/6,01+j30,5)=0,25+j0,5+5,597+j1,596=6,2123/_19,7°
-Ifl=265,6/6,2123/_19,7=42,754/_-19,7°A
It's/IfL=245,9÷42,754=5,75, of =cos (19,7°)=0,94 log
-T=3÷188,5×+(261,3)(261,3)÷(0,49+0,5).exp ×6,01=163 , NM
Pag=Two.sin =163,11×188,5=30,746,2
-Rotor copper loss:
P2=sPag=0,033×30,746,2=1033,9w
P mech =(1-0,0333(×30.746,2=28,7223
Pour=Pmec-p rot=29,7223-1700=28,0223
Pin=3×.V1.×I1×cos flux.
=3×265,6×42,754×0,94=32,0024
Eff rotor = 28,0223÷32.022,4×100=87,5%

-effinte =(1-s)=1-0,033=0,967=96,7%
STmax=0,2/((0,24)(0,24)+(0,49+0,5)exp2)exp 1/2=0,1963
Tmax=3÷2×188,5.[(261,3)exp 2÷0,24+(0,24)(0,24)+(0,49+0,5)exp .2)exp 1/2=431,68N.m
-Tmax ÷TpL=431,68/163,11=2,65.

STmax=1-(R2/(Xm+X2)=1-(0,58÷(2,6+0,271)=0,98
Breaking

Labels
Drawing

WS=2πf/P=(2π×60)÷2=188,5 rad/s
TL=Pg÷ws=19,602÷188,5=104N.m
Resistance reactance.
R'2=(R1+R'2)-R1=0,415-0,204 .ohm
R=P÷3×I×I=27,225÷(3×110×110)=0,75 ohm
X=√z.z-R.R=√1.207×1.207-0,75×075=0,95 .ohm
X'2=X-X1=0,95-0,485=0,465 ohm
-Rotor at start
RfL=R-R1=0,75-0,21=0,54 ohm

-IEEE..test for empire
Reactance rotation|sQuire cage design|w
X1/XL : a 0,5: B;0,4;c 0,3;D 0,5
X2/XL
_____
-Performan e characteristics
Tech=1/w×3.V1.V1/✓R1+(R'2÷S)]exp 2+(X1+X'2)=R'2÷S
-AT low value of slip
Timex ~ I/was 3V1.v1/R'2×s
At .value of slip .
Timex ~I/Was.3×V1×V1/(X1+X2)exp 2=R'2/S
- Tmax = 1/2ws×3×v1v1/R1+√R1.R1+(X1+X'2)
-stator core rotor friction and wind ,
Loss ,Pag ,pin Elec ,pmec ,windage loss ,P out mec,stator resi loss (3.I1.I1.R1)
-3phase
I.a.V1=460×√3=265,6 V ,start ,S=1,the input impedance,
Z1=0,2+ -j30(0,2+j0,5)/0,2+-j30,5=1.08/_66°
The starting current
It's=265,6÷1,08/_66°=245,9/_-66°A.

Wayne=1800÷60×2π=188,5rad/s
Vth=265,6×(-j30,0)÷0,25+j30,5~261,3V
ZThv=-j30(0,25+j0,5/0,25+j30=0,55/_63,9°
=0,24j+j0,49
Rath=0,24ohn ,XTh=0,49 ~x .
It's=Pag÷wsyn=I2.×2R'2/S÷w.a
=3÷188,5×(261,3) exp 2÷(0,24+0,2)exp 2(0,49+0,5)× 0,2÷1=

3.9-explanation: .
1.select base value:
VA base =150MVA, vbase =13,8kv,,fbase = 60hz,value base,
2.calculate RMS stator phase current base ,Is base , Is (base) = (MVA base ×1009)(√3×Kv base)=(150)(1000)/√3(13,8=6276A,
3.)calculate peak stator phase current base ,U base , I (base) = √2×Is(base)=√2)×(6276)=8875A.
-4) calculat statore base impedance Z, ,base ,ZS (base)=KV..base / MVA base =13.8)exp 2/150=1,270 ohm
5) calculate base inductance ,La (base ,
La (base) =ZS=(base)/Abase=1270/377=3,37×10 exp -3
6)calculate field base impedance Zfd(base)
Zfd ,base = (Lad/LAFD ,base =(0,0056÷0,0138)×8876=3602A.
7)calculate field base impedance Zfd (base)
Zfd(base)=MVa base ×10 .exp 6÷id(base ,=150×10 .exp 6 =11,56
8)calculate field base inductance Lfd (base)
Lfd(base) = Zfd (base /w base = 11,56/377=30,66×10.exp-3 H
9) calculate field base voltage ,EF d base
10).calculate direct axes armortiaeur base current current is ks (base) lad / laks is base , =(0,0056/0,0054)+8876)=9204
11)calculate direct axis armortiaseur base inductance.
lkd(base)=Zkd(base)/wbase=1,77/377=4,70×10 exp -3 H
I Zk , direct axis armortiaseur base current
-12,). 1kd (base)(load/laks)(base)=(0,0056/0,0053)(8875)=9204A.
13) calculate quadrature - axis armortiaseur base inductance ,L,kq (base)

Lkq(base)=Zkq(base)/wb=1,77÷377=4,70×10. Exp -3
-350×10 exp 3 W-(399,8hp)(746w/HP)-44,186w=7563
-calculatiin of efficiency because
=+399,8hp)(746w/HP)(100%)/[399,8hp)(746whp)+44,186wt, 7563w]=85,2%
-calculate counter ,EMF
(Tuvr)-(resist volt drop) -(reactive voltage ,240 /_0°
(1580/_-38.1°A)(0,0177 ohm)-j(1580/_-38/A)(0,046 ohm)
=240-22.0+j17,3-44,9-449-449-j57,2=173,1j-j39,9=177,7/_13°

-14 calculate quadrature axis armortiaseur base impedance L.kq(base)
Lkq (base) = Zk(base)/wbase =2246/377=5,96×10 exp -3
16.calxulate base mutual inductance between armortiaseur and field Lfd base ,lfk base =
(ifs(base) / ikd (base) Lfd (base)=
(3602/9203)+30,66×10 exp -3)=12×10 exp -3H
17. Calculate base flux linkage flux ,base .
Flux (base) = La (base) is (base) = (3,37×10 exp - 3) ×8875=29,9wb

-calculate base rotation speed in r/term ,
Base speed is 120 f base ,IP = (120)+60/2)=3600r/Min
-calculate base torque ,t base ,
T base = (7,04 MVA base × 10) minimum base ,
= (7,04)(150)(10 exp 6) ÷ 3600=293 ,kLb ,ft (3972 kn.m)
_____
Calculate per - unit base Quantitie for a 150-Mva ,13,7kv,60 Hz ,3 ph two pole synchronisation machine following constant axis mutual inductance between,
Inductance between stator winding a and rotor ,L AFA = 0,0054H ,Q axis mutual inductance between rotor stator winding a and q axis armortiaseur,Lakq= 0,0963 H ,the per unit system and denote rotor
-calculate procedure:
1. Determine the speed at breakdown torque synchronous in speed is calculated from the equation n,sync= 129 f/p , r/Min where ,f frequently,in Hz and ,P= number of poles this) synchronisation=120(60)(1800)×4 ,at the point where the torque in percent breakdown torque is 109,the speed in percent of synchronisation torque is 100,the speed %, of synchronisation speed is thus the rotor ,speed is not= 0,80 synch=0,80)×(1800)=14400trm
-calculate the hors power at breakdown
The general equation)+HP Min) /33,000f.t,lb=(torque in lb, ,n rot in r/Min)/52521 ; 16°z,,Lb , 13 in = ift
-ho = (torque in o in) (n rot ,r/Min)÷1,008,403,2
HP=(torque in o .in)(n rot in r/ Min)×10 .exp -6 break down,
HP = (10,50z in) (1440r/ Min) ÷10 exp 6=15,12÷10 exp -3, how = 1512 ..

- repulsion motor , 24 slot the armature ,
Slot ° (24)+2)=48 coil
ZR=(3,5×10 exo -3 WB)(576 conductor)(3600r/Min)(2poles)/√2)+60hz, (2pharh)=85,5

-calculate the AC impedance of the rotor circuit.
-inductuve is calculated XL=WL=2πfL.
Frequency,L=inductance,XL=(2π)×(60)×(36×10.exp-3H)=13,5ohm
Impedance of the rotor circuit is R+jxl=2,7+j13,6 ohm =13,9/_78.8°

-IK,R,JXL,VL,,
Flux magnetic properties
T=K.flux.il..kflux ,
T state /IL=2,3N
m/3,6A=0,639wb
IL=VL/Z=120V ÷ 13,9=8,63A
-3.Calcul the AC starting torque
T=k.flux.IL, T start , ..k.flux.il=(1,53wb)(8,63a)=132.
4) calcul counter efn
EA=VL-IL.Z..IL..to , 85% first càlcul
-j48.1=|20.7/_-240V, repeat IL,24°, EA = 120°/_0°-(3,6/_-24°)+13,9/$78,8°)=120-
50,04/$54,8°=120-28,8-j40,9
=91,2-j40,2=99,95/$-24,2, -24° remain
Pmec=EA.iL=(99,95)(3,6A)=359,8w
-VL lag VL, of ° cos 24,2°=0,912 from information ,
Pmech = VL×IL×cos-coppwr loss = VL×IL×cos-IL×IL×R=
(120v)(36A)(0,912)-(3,6A)(3,6)(2,7)=383,97-3499=359
359.8w. VL=120/_0°.
_____&&
Drawing label
Phasor diagram motor universal :
ea°99,95/_-242°V,
|IL.R|=972V.
IL°3.6/_-24,2°
--------_____
Repulsion motor drawing diagram

3.9.Explanation,
-J√3.V.V/XD.
roduis ,is RF=√3.√Emax /XD=
√3(10)×(1,85)÷1,78=1,8p.u
V=I.××o×p×u,
Local , o (-10×√3)÷1,78=0,-j 9,96
-3 calculate steady state.
Jv2÷2(1xe-1÷XD)=J/2(I÷0,4-1×1,78)=
J.o.96.
RL=roduis
=V2.V2(1÷Xe×1÷xd)=1÷2(1÷0,4+177)=1,53pu.

- 3.10 explanation: GENERATION REGULATION:

-Ea=0,00219,power factor =0,975 ,zero
-Calculate potier reactance,XP
So=E+√3×Ia×xp , from zero power factor,.Eo= voltage at not load E,I,S. Terminal , voltage in RD= RE+DE,, DE=√3×Ia×xp
XP= Is xp÷(VLL÷√3)=D.E÷VLL=DE÷RE=0,43Pu,
EP=1,175Pu.
-power output and power factor.
Calculate the maximum output ,power for an excitation increase of 20% for a 13,8KV ,eye ,connected generator having a synchronous impedance of 38ohm phase it is connected to an infinite bus and delivery ,3900A ,at unity power factor ,
-1 drawing phasor diagram, subscription indicate initial conditions , voltage vs ,the line -to-neutral Angle and between the phase voltage and phase current.

2 .calculat voltage behind synchronous reactance
E=(1X,)+1X)-V.V] exo 1/2 = [3900×3,8÷1000) exp 2 -(13,8÷√3)]exp 1/2=14,54 KV
3.calcul maximum power Pnax
Pmax=3.E.V.I.X ,,sin§=1 for maximum
Power ,20% higher excitation.
Pmax = [(3)(1.2)(14,53)(13,8÷√3÷3,8=110MW
-Calculate power factor,
Flux =E.I÷Xs=14,53÷(3,9)(3,8)=0,97

-per unit Quadrature axis reactance calculate the synchronous and substrasient per unit reactance for the quadrature axis of the machine in the first , additional data ,for the machine are ,q-axia armortiaseur ,self inductance L,K,Kq=0,0107H, and the ,q-axia Lak = 6,3×10 exp -3 ,
-calculate ,Law

From value obtained in the two previous,
IQ=Lq/La(base)=0,0058÷(3,37×10 exp -3)=1,72 pu.
-calculate .IQ
L.q=Law+L1=1,72+0,12=1,84
Calculate ,Lkkq and Lakq.
L.k.kq=L.k.q÷Lq(base)=0,0107÷(5,96×10 exo -3)=2,80 Pu ,
IA.kq÷(La.base)+ base) ÷Ikq(base)
=(6,3×10 exp -3)÷(3,37×10.rxp-3)(8876÷8172)=2,72pu

4)
Calcul per unit value of q-q ,axis armortiaseur leakage inductance ,IkQ ,1kq=1k.kq-ILq=180-1.72=0,08Pu

5).calculate per unit transient inductance.
Lq=Law.Lkq÷(Law+Lkq)+L1=(1,72)+0,08)÷(1,72+0,07)-0,12=0,195 Pu
- calculate if and ikd
The quantity are ,ifd rfs ,Zsd (base)=
0,0072÷11,56=6,23×10 exp-4, and Ikd= rkd÷Zkd base ,= 0,028÷1,77=0,0158pu
-calculate field open circuit time constant,T,ok
T'd=Lffd÷Ifd=1,74÷(6,23×10 exo -4)=2793,Pu
-calculate: substrasient open - circuit time constant,
I" o/o=(I/Iko)(Lkd+lfd.ladπlfdd)=
(1÷0,00157)(0,19+(008)(6,66÷1,741)]=16.9Pu
-Calcul per unit transient and subtransion short circuit time constant for the direct axis the direct axis armortiseur leakage,time constant ,
-calculate per unit transient short circuit time constant ,Ta
T'd=(I/FD)[Lfd+Li.los÷+Le+Lad)
[1÷6,23×10 exp -4)(0,08+(0,12)(1,66)/(0,012+166)]=308
-Calculate per unit substrasient short circuit time constant ,T" oO
1÷F.kd×[Ln+1÷(1/Lad)+(1/Lfd)+(1/L1)]
=1÷0,00158×0,19+1÷(1÷1,66)+(1÷0,08)+(1÷0,12)

- 3.calcul per unit armortiaseur leakage time constant ,Tkd, Tkd=Kkd÷Ikd=0,19÷0,158=12.pu
I/w(base)=1÷377, Y=T÷377

-phasor diagram synchronous generator
1.determine
If the Va and V base value are equal to the machine rating ,Is base =
(MVA)×1000)÷√3kv=(100)(1000)÷√3)(13,8)=4184 ,base voltage a ,13,8 kV ,per unit RMS , terminal voltage ,is Ei=1.0 Pu

Per unit peak voltage
Teta = U.O/$0°.P.u will be chosen ,phasor
2) local ,q- axis ,
EQ=|EQ|/§ machine internal power angle. EQ, ,,Eq° a+ j(r+ jxq), but ju = 1.0/$0°
Pu,where, Teta = cos -1 , 0,8 = -36,9,,,EQ=1/_0°+1.0/_-36°×j1.84=2,38/_35°
Pu power angle ,×=35°
- Calculation a frictional ,EQ=|EQ|/s.
-ea=|a|cos§=(1,0)(0,819)=0,818pu
ed=|a|.sin×=+1.0)(0,573)=0,574 .Pu and
Jq=|j1|.cos(§-teta)=1×0×cos(35°+36,9°)=0,311 ,Pu
JD=|j|.sub(×-0)=0,951.pu

-voltage ,E1, Q axis represents.
E1=Xad,j+d=eq-xd.is+rid=0,819+(1.89)(0,951)=257pu
- explain, Generatie - capabilities curve :
generator , supa ability curves , supplied the manufacture is used to determine the ability of generator to delivery real (Me) and reactive ,(MVar) power to a network determine the capability curve in per unit value of a generator
-characteristic : 989 KVA ,of = 0,85 synchronous reactance ,XD = 1,77 Pu , maximum value of generator internal voltage ,Emax =1,75 p.u terminal voltage ,V= 1.9 Pu ,§= load angle and the system reactance external to generator ,is XE=0,4 .p.u
-calculate stator limited portion stator ,limited is directly proportional ,full power output ,arc ofa circle medium ,Rs=1,9 p.u
- calcul field - limited,P=(3×V.Emax/XD)
Sin§+j(√3.×C.E.max÷Xd.cos§-√3.V.÷XD)

Explanation:-Generation rating for installation:-generation rating in MVA = turbine rating in MW /power factor,generator for 600-MW=rating 600Mw /0,99=677MVA.-o

3.11 Explanation: calculate generator output ,P
Po= √3×KV×IA×pf=(√3)(25)(28.000)(0,975)=1.182,125kw
-calculate generator officiency
Efficiency=power out put)÷+power output+total losses)

=1.182,125÷(1.182,125+10.910=0,99
-calculate synchronisation coefficient at rated load for the following generator : 75.000kw , terminal voltage ,V=I×o×p×u, armature current,
IA=I×p×u,
Quadrature axes reactance ,X2=1,8 ×pu×
Of=0,80 lagging , neglected the resistive components of armature
- calculated rated load angles §
The angle §=tan .exp -1.[xq×cos$×Ia÷(Ia×xa×sin$+V)]
Tan .exp-1[1.8)(0,80)(1.0)÷[(1.0)(1,89)(0,6)+1]=35°
-calculate synchronising power coefficient,Pr
Or=(rates kW)÷(rates load angle × 2π÷360)=(75)(1000)÷(2π÷360)=122,780 kW/rad.

-Generation efficiency:
Determine the efficiency of generator having the same basic characteristics of the generator in the generator regulation additional data including armature full load current ,IA=28.000A ,core and short circuit losses a friction and windage ,loss ,500Kw ,from drive rotor input ,armature , resistance ,Ra=0,0011ohm phase excitation voltage a rates ,470C, excitation current for air gap line 3200A,and output voltage ,25 kV ,compute core loss from and the potier voltage So=1.175 ×p.u, loss 21000kw

-determine short circuit loss for 1.0 Pu line current ,short circuit loss =4700kw
-calculate stray current loss ,stray current ,loss =short - circuit ,loss , armature,loss =4700-862=3838Kw
- calcul power for excitation power for excitation=field voltage ×IfL
=(470)(2,4)(3200)÷1000=3610Kw, IFL

-Determine e total losses :
--friction and windage : 500kw
Core loss. : 2,100kw
Armature copper loss. : 862 kW
Stray current loss. : 3,838kw
Power for excitation. : 3,619kw
Total losses : 10,910kw

-Explain: Generator grounding transformer and resistor.
-determine the size of a transformer and resistor required to adequately provide a high resistance ground system for a Wye, delta start connected generated rated 1009MVA ,26KV ,60GZ,in addition generator capacitance= 1,27 ,if man transformer capacitance =0,12 if ,generator lead capacitance= 0,01uf and auxiliary transformer capacitance = 0,024uf

-calculate generator line -to -neutrak voltage ,VL- N=(26kv)÷√3=15kv
-calculate total capacitance ,CT
CT=to+1,27+0,12+0,01+0,024)if=1,424 uf .
- calculate total capacitve reactance ,Xct
XcT= 1÷2πfcT=1÷(6,28)(60)+1,424×10 exp -6)=1864 ohm
-select ,R= XcT to limit transient over voltage during a line _to_ ground fault assume a 19,92÷0,480Kv
Transformer the resistance reflected to the primary ,is .R'=N.N×R, R' is the requirements resistor ,solve ,R=R'B.N ,,, B= 19,92π0,480=41,5
R=1864÷41,5 exp 2=1,08 ohm

-calculate transformer secondary voltage ,Vs during a line - to - ground fault ,vs = Vs = 1500÷41,5=361V.

- calcul current Is , through grounded resistor ,Is° Vs÷R=351÷1,08=334,3A
-calcul required continuous rating ,in KVA grounds transformer rating is KVA ,= I,V, = (334,3)(361)=120,7kva.
- sele

- explain:selected short time rated transformer from ANSI standards ,a50 -kva transformer may be used 9 Min , rating is adequate,

-calculate generator line -to -ground fault current ,If , if = V/XcT =15.000÷1864 =8.05
-Power -factor improvement.
An industrial plant has a 500-hp induction motor load a 4000V, with an average power factor of 0,8 logging ,and a erage motor efficient of 90% ,A new synchronous motor rates at 3000hp is installed to replace on equivenlent load of induction motor the synchronous motor efficient determine the synchronous motor current and power factor for a system current if 80%od the original system and unity power factor

- calculate initial system rating KVA
The rating is KVA=(HP /b)(0,745/of)=(500/0,8)/(0,746/0,8)=518KVA,,n efficiency
- calcul initial system current I o
Io=0,8Ii°(0,7)(746)=597A
-neq induction - motor ,I1
I1=0,746 hob/. √3.n.pf =(0,746)(200)/√3(3)(0,9)(0,8)=299A,
- cal synchronous - motor power factor ,- PFA = 3588/40/1=0,895
-calculate synchronous motor power factor PFA , PFS = 358,8/401,1=0,895
Related calcul verification synchronous rotor horse ,3000hob,,,ho's=3×V×I×n×pf/0,746=
(√3)(4)(401,1)(0,895)/0,746=3000hp

-

me

- 3.14. explanation: design calculation: autotransformer starting;

Labell drawing:

Alpha= voltage tap = VLA ÷Vs
ILA= alpha / LA = motor ,
ILL=alpha /ILA= aloha K1= Line current for
= Alpha, I1+0,15In for (a) motor torque

-ZL= total input impedance
ZL=motor impedance
Rs=starter resistance
ILR=motor current .

Motor locked rocked rotor resistance
ILR=VLR÷ZL=alpha.VL÷ZL=IL
|Z×IL| I=I×RL+jxl, I=VL÷IR=VL÷alpha×IL

=(Z/alpha) Ohm
-RiL=Rs+RL=√Z exp 2×IL- XL.exp 2
R.S = (RiL-RL)
Of = cos (Teta) = RiL + ZIL

-multi step starrting :
. drawing:

R'2/Smart/
-Rx1=Rmax
-Rx2=S1.R2.Rx4=S1.Rx3
-Rx4=S1.Rx5
rx1=Rx1-Rx2=
Rx.z=rx2-rx3
Rx3=-rx4..

-speed control operating supply,
Tm1÷Tm2=S1÷S2÷4
Tf1÷Tf2=N1. Exp2/n2 .exp 2 =(1-s1) exp 2/ 1- S2) expb
Impedance motor
XL=WL, r+jxl, T= k ,flux,L,, T = k.flux
-Po=√3×Kv×A×pf

-e valuation of annual O ,M cost Vs installed capitals cost

Cost component | unit A. | Unit B.

-Net unit heat rate .|10,55 MJ/kWh| ..-/-
-unit availability. |10.00 but kWh| -/-
-unit rating. | 95%| -/-
-installed capit cost| 600Mn| -/-
- levelized average | 18.00 % | -/-
-for annual fixed
Charge (9450×10 ,exp)(118/100)=18709×10.exp ,6
Annual fixed charge
Annual cost used for compare

91,69×10 ,exp 10 ,exp 6
- cost penalty

-3.14. Explanation :Overhead transmission line and under ground cables :
-calculate flux one conductor

-Inductive impedance
©
©. ©
- transmission line geometry portion
Diagram
.
-effect of mutual flux line.

- charge two conduct .
..Is , RK, K ,IR

Long lines Vs = VR+IRZe),expb+(VR-IR-Ze)e .expb along
Is=+VR/Zc+IR)exp + (VR/ Ze - IR) ,exp ,e - alpha e
Zc= √ Z/y- ,, propagation cost ,,
Alpha = = √ Z.y , per kilometre .

- calculating sending voltage for (200 m transmission line receiving to - line voltage ,is 239 kV ,and the is 200 at power factor ,0,8 logging promote ,R=0,2 ohm , L = 2 MH , C = 0,01 if , f = 60 Hz
Determine YL , and ZL ,
.TL = hw × CL × 1/km .1=jb×77(0,01)(19 exp -6)/km×320km= j.1206 micros sub(micro second)
ZL=RL/km×1+XL/km.×1=0,2 ohm/kn(329km)+377(2)(10 exp -3) ohm / km × 329 km
=-6,4+j241,3ohm

-capacitance of two wire line :
E=P×L/2

-Capacitance of two -wire line
E=P×L÷2×π×€×r
Vab=(resistivity ×length÷2×π×€) Ln(b÷a)
E=(resistivity ×Length÷2×π÷€)[1÷r-1÷(D-r)].V/m
r>a ,center
-V1.r=(resistivity ×Kength÷2×π×€)ln[r(D-a)÷a(D-r)].C
-D>a ,V÷2=(resistivity ×Length÷π×€)Ln(D÷a)×V
-C'=q÷V,, Q= resistivity ×length ,,
C=C'/Lor,C ,,π÷Ln(D÷a), f/m

-find capacitance to neutral for conductor transmission line ,if = D=8ft×(2,4m),a=0,25 in (0,0°625)
Length of line is @0m.(16km), frequency is 377 Rod
-ZC=1÷w×c , substitute for ,X=0,0388 ,log (D÷a) obtain
-XC=1÷(377)(0,0388)(@0)÷log (2,4÷0,00625)]=0,0026 M,

-phase quadrature components
,start motor ,
VL= 120°/_0°, phasorw locked rotor ,Is=8,4/_-145°
A=8,13-j2,10A , similarly

In= 12,64/_-40,0° ,A = 9,69-j8,18
In phase = 8,13+9,69=17,82A
Iquad ,= -j2,10-j8,13=-j10,23A
I star= 17,82-j10,23A=20,55/_29°
Pfact start = cos 29°,86=0,867
T,start = k.Im.sin.a
=(0,18V,s/A)(0,4A)(12,05).sin 25
=8,46V

ZA=Za×bZ×Ca÷Zav-Zbc+Zc

Zb=Zab.Zbc÷Zab+Zbc+Zca
Zc=Zbc.Zco÷Zab+zbc+Zca

Zab=Zab+ZbZc+ZcZ2÷Zc
Zbc=Zazb+Zb.Zc+ZcZc÷za
Zca=Zazb+Zb.zc+Zc.iz÷zb

(Xa.zb+xb.xc+XC.xa)÷xc
zbc=(xa.xb+xb.xc+XC.xa)÷xa
XB.xc+XC.xa)÷xb
Xa=Zab.xca÷xab+xbc+xca
XC=xbcxca÷xab+xbc+xca

Labell
Generator ,12,2 kV, x"=0,19pu,50.000kva

Motor 1: 30000KVA,X"=0,29per ,,4,2kv
Motor 2: 20.000kva,X"=0,25. , 2,2 kV
-tfo :
Primary : 13,2kv,: 50MVA,,,
Secondary: 4,2kv, 30MVA,,
Tertairw :2,2kv,,20Mv

Label ,R'j0,68,,,L2=10,012; ,j0,002, equivalent,0,034
Correct motor reactance ,X" motor ,0,2 base ,30.000kva , 4,2kv,
(0,20)(50,000/30000)(4,2/13,2)Exp 2=0,034Pa,
X" load 2, 20000Kva , 2,2kv
(0,25)(50,000/20.000)(2,2/13,2).exo 2=0,017
Calculation of complex power ,P+jQ
Balanced 3 phase, ..
5.0/_-37°, line voltage ,is
69/_0°,per unit base of ,10000KVa and 72 kV,,

- design drawings ,

.Ix. Matrix
|0. 1. 1 |

|1/_60°. 0. J |
|1/_120° -1. J|
_____=0,863/_191,67°
|1. 1. 1|
|-1. 0. J|
|0. -1. J

Explanation-Electric -power network
2generator. // :13,2kv , and ,13,2166, sending bus ,6,6kv ,,Tertia ,transfo motor , 7,5kv , and transfo 66 kV /12 kV , output ,6motor M1,M2,M3,M4,M5,M6, 0f 12 kV parallel ,,

Labell , circuit generator with tree impedance Serie ,j0,101,,j0,03, j0,10 line and transfo two motor Ma,MB ,impedance ,j 0,222,,,h0,333

_____
Explanation
Generator 1=40.000kv, 13,2kv,,X"=0,20
Generator 2=30000kv, X"=0,25 Pu
Transformer=75,000Kv , 13,2kv,, 66,kV, x = Pu

_____
Calculate , impedance :3000kva ,
Jxtotal=(j0,15)(j0,25)÷(j0,15+0,25)+(j0,04=0,134pu

_____
Generator react .
X"=(0,25)(3000/300000)=0,24pu
30.000kva,, X"=(0,25)(75,000)/300000=0,625pu
Transfo reactance ,
X=(0,1)(30,000/75.500)=0,04 ohm py
30.000kva ,base

3.14. -explanation: Phase shift in Wye Delta.H2=B,, IBH2=A,IA,IAn,,,Generator GA ,line ,motor 0ne,ZB=0,6+j0,77 GB -ZA=15+j1,5 ohm O=√3.E/ne.IL×cos,P=E×I×cosIA=PA÷EA×c

-explanation:
-Bus iV^,, Is, Vs,, Vy^, bus j ,,I pi,you, IPS ,,
-find slack bus power PG, ,i-j
Yn=Is+Ipr(v1-vy)ys+V1.p1

-Power,
Sn=Pn+jQn=V1.In=V1(V1y-Vj)y+|y1|.y1|.yP1.
Sjn=Pjn+jQj=Vy.Iy=By(V1x-V1)us+|Vy|.yP1.
-Power loads in line (1-j)
Slip=Sij+Syi
-Talor
f(x)=f(a)+(x-a).df÷dx|+(x-a).n÷2!×d.df÷dx|+....+(X-a).expn÷n!×d n exp f ÷dx. Exn +Rn. df÷dx|a=,
Value derivatives evaluation x =a,
Serie converges if , Lim ,n to inf .Rn=0
Non linear.
-f1(x1,X3,.....xn)=y1
-f2(x1,X2,.....xn)=y2
-fn(x1,X2.....xn)=Yn.
FK(x1,X2,.....xn)=y, k=1,2,3..

|y1_f1(X1,°X2°....Xn°|
|y2_f2(X1°,X2°....Xn°|=
|yn-fn(X1°,X2,.....Xn|

|df1÷dx1|x1°df1÷dx2|x2°...df1÷dxn|Xn°|
|df2÷dx1|x1°df2÷dx1|x2...° df2÷dxn|xn°|
|dfn÷dx1|x1°dfn÷dx2|x(°).dfn÷dn|Xn|=
[ΔX1]
[ΔX2]
[Δxn]

[Δu]°=[j]°[Δx]°
[Δx]=(oji°)exp 1 [Δu]
[X], =[x]°+[Δx]°
[x]•=[x]exp k +[Δx] .k

-newton- raphasor , method applied to power flow

P1=sum ,n ,k=1,|V1||VK||yik|.cos(§k-§1+ aphk)= f1p.
Q1= -sum,n,k=1|V1||VK||y1.k|.sin (k-§1+alph ok)=
I = 2...

-transformers regulation determined from short circuit test ,
-% regulation = [V input - V output) V input) [100%](2300-2236)÷23000](100%=2,78%
Single phase load current, KVA = V.I÷1000=apparently,
I= 10000kva /v=(1000)(5)/23000=2,17A
Test ,of = of = W÷VA=of=90÷66)(2,17)=0,628
Lagging, cos -1,= 0,628=Teta =51,1°, cos 0,80=Teta,369°

- transfo output voltage for serving ,0,80 of load rated ,VIR = VSS cos (Teta - load) 66,cos (51,1°-36,9°)=66cos,|14,2°=64,0 where Vs = short circuit , impedance phase angle ,Ix ,,
VIX=Vsc.sin(Teta 11-teta load)=,66sin 14,3°=16,2, V input = (Voutput + ViR),exo 2+(VIX)=2300,exo 2= (Voutput + 64)exp 2+ 16,2 exp 2 = 2236 V ,

-induct of two wire transmission
©<----D---+->© , lM day °(u÷2π)[1/4+lnD/a)WB
Turns / m ,, L= lamb /1.. L=(2×10,exp-7)
[1/4+ln(D/a).H/m, inductance ,L may be expected,
L= (2×10 exo 7) Ln (D/r) r ' = a ,
LR = 2 L = (4 × 10 ,expb-7) ,LT° 1,482×log(S/r')

-
...

[

-3.15.explanation: two wire ; 10mi(16,1km),two transmission wher ,D=
8ft(2,44m), a=0,1n(2,54mm),at a frequency of 60hz , 377 rods /s ,
- geometric mean raduis GMR ,r'=0,7788)(2,54×10×10 .exo -3)=0,0019780,
Calculate LT=(4×10 .exob-7) ln(D/r)=(4×10 .exp -6) ln (2,44/10.001978)=28,5×10,exp
-reactance XL=(377)(28,5×10 exp -7)ln(2,44/0,001978(=28,5×10 ,exp-7hm)(16,1×10ezo ,3)=173

-1.©|<------D'11---------->©1'
2©|----D22'----->©2'
3©---------->D33<----------©3'

Lamb=(u/2π)(I/3)[1/4+ln(S11.Ia)+ln(S12.Ia)+ln(D13.Ia)-ln(D12.Ia)-ln(D13.Ia
D11= lamb 11=(u1/2π)ln[D11,D12,D13) ,exp 1/3/(r'D13DB)1/3
-insuctan e , L1=lamb/(1/3)=(3×2×10×10,exo -7)lb(D11.D12.D23)1/3÷(r'D12.D23)1/3
L2=lamb 2/(1/3)=(3×2×10,exp-7)ln(D21,D22,D23),exob@/3÷(r'.D12.D23)1/3]
L3=lamb 3/+1/3=(3×2×10.exo -7) ln (D31,D32,D,33)1/3(r',D23,D13)1/3].HM
Lavg=(L1+L2+K3)3 and ,L1+K2+K3)9H/m
-LT=(2×10,exp-7)(lb[D11,D12,D13)+D21,D22,D23)(D31,D32,D33]exp -1/8÷r .exp 3.S12.D13.exo
2,D13, exp D ....
©
©. ©

Xa=(2×10 exp -7)(3([1/4Ia+IaIn.D12/a+IbD13.Ia+IB.IbD21/a+IC.ln D 31.Ia)+(1/4.Ia+IA .ln
D21./a+IA ln.d23/a].IV.lnD32.a+IC ln DD12/a)+(1/4Ia+IalnD23/a+IA.lnD3+Ia-
Ib.lnD13/a+IclnD23/a).IA,Ib,Ic
RMS,phase ,IA+IB+IC=,,D12=D21,D23=,vS 13= D32,
Lamb,a=+2×10.exp -7)(Is)/(3)ln(D12.D23)/a.a.a+3/4].Qb turn/
-L.dlux=(2×10 .exp -7[ln(D12,D13,D23),expb1/3÷r'],H/n

©<---------->©<---------->,© calcul ,
3,6m. 3,6m
1. 2. 3

L ,flux(2×10,exob-6).ln(3,5×7÷3,6).exp 1)3÷0,01=12,2×10,exo -6 ,H/m
Calcul inductive reaction
XL=377×12,2×10 exo -6,H/m × 1600m= 0,64 ohm

a1©-----D------© c2
V1©---------Db1.b2--------©
C1©. ©a2
GND=(Do1b1,Da1.b2.Da@.adb,D/a, db1,) expb1,

-aluminuim conductor steel reinforcement (ACSR(
-code|size|alum|out| resisC,|phase to n

Word| mil | aton|

Complex penetration depth
Drawing

o=√p/(jw), self impedance Zn,
Z,,=R1+JW×.uo÷2π×ln×2(N1+o)÷(GMR1,,,
JW,uo÷2π.ln.
Mutual impedance:
Zk=JW.yi÷2π.Lb.Djk÷Dk..
Dik=√(h-hk).exo +DL.dl.k

|ΔVu|. |[Zu][Zug] [Ky]
=
|Δvg|. [zu][zgf] [ig].
-voltage drop growing wire ,[Δvg]=0,
Zu÷zgg÷[u]

Drawing label:
Size conductor in wire solid ,scale 250,ruler ,/2,8 ,,
- reactance ohm scaling ruler ,1100, correction for multi conductor cable , single conductor in conductor in core , multiple conduct,.
.-aur earth , conductor core ,insulator

|Δv1a|. |Z11a, z12a,0,0,0, 0|. |Ia. |
|Δv2a| =|z12a,z22,0,Zab,9zac|. |I2a|
Δv1b	.	0, 0, z11b,z12,0 0.	.	I1b
Δv2b	.	0, Zab, z12b, z22b, zb		I2b
ΔV1c	.	0. ,0, 0. Z11A, z12		I1c
Δv2c	.	0,Zac , oBx , z12,Z1,		I2,c

-Δv1=ΔV,core - Δ v hearth ,,
-ΔV2= Δ V sheath
-I1= I core ,
-I2=I2 heath core ,

Z11A= z core out + z core / shear insulation+ Z sheath,
Z22= Z2 sheath out + z shear /earth insulation+z
Z12=-Z - sheath - mutual
-zab = z mutual earth - return on,
-zac = z mutual earth , return ,AC
Zbc = z mutual earth ,return .

Z mutual earth return
=Jwu÷2π{ln(aloha ×m×d÷2)+1/2-2/3ml
-cable buried ,M=√wju÷p

3.16 Explain : balanced charging 230Kv, 3Pg , transmission reactance ,0,2 m.pohn ,mi phase(0,32 ohm ,the line ,is 80 mi (28,7km)Lo
XC= 0,32÷28,7=0,0924m ohm
For voltage - in neutral , 239 × √3= 133kv , charge IC, (10 ,exp 3)(0,0925×10 exo 6)=53,2A

3.16. Explain:Data required: composition of EHv , transmission line -fault ----------|types | 765 | WHV comp | 115KVOf

-substation ,Bus ,CA350,F2,,CBL0004
500, CBL-400, 2000A, CBLO,,1000A,
Feeder, diagram showing ,I Raley =Iprimairt÷NCT=1000A÷120=8,33A,

-Differential current fault extremely

600:5,CT,Rd,, 41,7A,,,7000,,58,3,,,100A,relay ,

-bus fault,
VCT=excitation volr ,
If=current ,.Ncf=current ratio
R lead =0ne,wayle,
KP=2,
RCT=current

Sect 3.,
COGENERATION:
-Power output developed by turbine stages ,
-generator and mechanical losses , B
-Boiler feed and consent pump power conscience gross and fuel heat rate ,feed water heat balance .
Gas turbine based cogeneration plant ,gas turbine.

-superheater yes boiler yes steam generator,,
Steam turbine ,process steam extraction , separator yes , generator yes , feed water heater , condense , condenser.
-cogeeneration plant
-output : kj /kWh (Vtu/kWh), heat rate =(Q1-Q2)÷P
-Q1=cogeneration plant ,, Q2=conditional steam generator
-compressor , combust , heater recovery steam , dearect , condensation return ,feed water

- cogeneration plant cycle based on turbine as the primary expression efficiency =(P+H)÷Q1,plan

-Calculate procedure , divide into sections.
- calculation total power output in each section section power output =W1.ΔH1/3600,where .
W1=steam flow through section in kg /h (Lb/h,ΔH , enthalpy drop across section in kj /kg (Vtu/LB
3.calculate total power output,
Total power output =sum ,n ,t=w1,ΔH1,/360

-rehearer. Yes 349435kg/h 3336kj/k,boiler superheater 389687 ,,
Steam generation , Sja 2383kg/h,
High pressure turb, intermediate pressure turbine, low pression turbine 1,14MPa,159444kg/h,; 3245 kj/ yes ,process system ,,700kw, 1200kw,, mechanical generator ,, 94100kw generator, 389,687 kg/h , 1041kj,,, OTTD,Fw6, 5,5 DCS ,,822,9 KJ ,,, 0TTD fws ,5,5, process steam ,, 0,62

MPA 6748,, 2,8 TTD FW ,,4772kg , 355,6 KJ ,2,8TT ,FW ,, 2,8 TT fw, condenser

-STCP heat balance for 94-Mw generator ,SjAE= process plant steam jet ,air ejector ,P= MPa , measure ,pressure ,H =KJ/kg

...

-3.18 explanatjon :Electric energy economic method:
-regulated environment
-theory of the firm, P=f[Q],stating
-production costing
- project selected,,
-framework energy market step
1 regulation ,yes standard compliance reliability security =yes, iso yes , supplies yes primary, transmission yes , distribution Tess , exchange yes commodity cash future planing yes market brokers contract search ,
-P=f[A],
-Revenue (R)for compagny use expanse capital expense operating expenses is easy, R=P.Q
-supplies , capital cost operation maintenance, individual suppliers curves work product cost . (CP),,capital cost (k)
CP=g(k)+h(Cr)
Marginal cost production
(MCp) Derivatives of the cost production ,
MCp =dcp/dQ,
-Average cost production ,
(ACP)-Ia the cost ,ACp=P/Q
-total products cost indirect ,IL=R-Cp
Price , demand, supplies, supplies actual price , competitive, qualities,

-Ed=-(P ×.dq)÷dP×Q)
Ed>1, demand is constantly,
Cost of money,
Find weight cost ,IB°I0,percent

Stock interest rate ,IP=12% and return on common stock ,IC =15 ,percent , preferred stack, IC = 15 percent , fraction of bonds ,DR=50%, fraction stock CR=35%, prefferes stock , ratios fract preferres stock , PR = 15%

_ computer the cost of money the weight cost money (I)
I=iV.DR+IP.R+icCR=
I=(10)+0,5)+(11)(0,15)+(15)(0,359=12,05%

-equivalent and compound interest. cash flow (f),future value (P)%,rate of inflation (I,I) for future period (j) future period payment (n),
P=f÷[(1+i.i)..(I+in)]

-simplifie ,
P=f÷[1+I).exp]
Annuity = P=a(1/1)[(1+I)exp n -1]/([1+I),exp ,n
Inom =(1+1eff),exp ,m-1
I.eff=exp(Inom)-2), discount,
,sum of years digital depreciation ,cash flow,

----------_---------
-data declined balance
----------_----------
Year| remaining| annual. |accumulated
  |Balance|. Depreciation | depreciatio
----------_-----_----------
1. |1,0. |0,40. |0,4
2.
3.
_____
Income stat for share holder
_____
Revenue 25000
Operating expenses. $350
Interest. 300
Depreciation. 600
Income tax 420
Total expense. $1675
Net. Income. 853
._____

-find breaker even loading between units value $ 17,55/mwg is found at 40 Me loadt onunit A,and $ 18,00/MWh is found at a 6 MW loading level on unit C ..

Data.	Unit A	unit B	unit. C
Full load Mw.	50.	35.	16
Heat rate.	1200	12500	13,500
But/kW.	11,375	11,849	12,323.
Fuel price G ,	1,50	2,09	1,50
$MBTu.	1,58	2,11	1,58.
Minimum loadMw	13	10	4
Incremental Hr			
Minimum load kj/kWh	,10,550	11,100	11,
50% load kj /kWh	11,280	11,100,	111
100%loaskj/kW,	12,00	12,500	13,00
Incremental fuel cost			
Minimum load $ MWh	,15,84.	22,4	17,55
50%load $ MWh.	16,92	23,75	18,72
100%load $ MWh	18,00	25,00	19,0

Loading schedule for unit A,B, and

system load	fuel cost	unit a	unit	unit
27.	15,87.	13.	10	4
39	16,92	24	10	4

...

[

-3.20 . explain : find loading , daily load factor,ration of the load energy is in the the day to the

energy represented by the daily peak dsmt multiplied by 24h fund the daily load factor LfD, when the daily - load energy is ,21GWH and the daily peak demand is 1000MW ,

- Multiply the peak demand by ,24 h (1000)(24) = 24,000 MWH =24,GWH,
- Determine the daily load factor LFD = 21GWH/24, GWH=0,875

-Annual load factor, annual peak demand, multiple by 8760 , estimate the annual load , factor demand daily,
LFA=LFD=0,875, motion the annual load factor demand daily,
LFA=LFD=0,875, motion average daily peak load to monthly peak load ,RwM =0,85 , motion of a average, monthly peak load to annual peak load RMA = 0,8

-LFA=LfD.RwM.RMA=(0,875)(0,85)(0,8)=0,595

-load management , purpose direct energy usage away from peak load period , method peak , sensitive rate structure and automatic control of power consumption load diversity find the annual load factor LFA ,when average , daily peak load is reduced ,5% from ,1000MW,to 950 MW , assume RwM=0,85 and RMA=0,8

-find energy associated with 950 MW for 24 h ,the energy is (959)(24)=22,800Mwh
Find resulting annual load factor with a daily load energy 0f, 21,000Mwh
LFA=LFD.RwM.RMA=(21,000/22,800)(0,85)(0,8)=0,62

-cosr stored energy available charging by conversion efficiency 70%,unit energy for discharge CDC=,
.-force outage rate ,generating unit that operated 6650 ,in one year 350h ,force outages and 1860 on schedules shut down ,
=For=FOH/(FOH+FOH=,force outage hour, ,,SH = service hours subtitut ,,
350÷(350+6650)=0,05=5%

-Energy available storage is (6)(50)(057)=210MWH
Savings from operating storage (SsT),for 18,9 Mila ,kWh,, displacement energy at 35 mils / kWh is
-Sst =210j(35-18,9)=$3381
Cost , discharge

_____

Plan. |plant cost| levelized fixe|total fixe
|$kw per y| 0, kWh per yr| y

_____

A,
B,
C,
_____
.-investment tax credit =(3000)(0,10)=$300, income taxes ,
Generate income statement to share holder .

-Revenie. 25000
-Operating expenses
-interest depreciation
-depreciatiob
Income tax
Total payable
Net income

Project selected ,rate of return / minimum attractive rate of return cash flow is method to estimate interested rate equivenlent for cash loan ,be purchased for $ 1500 with $500 down payment , assume that friend
- Amount barround , $15000
10, percent interest 2yr , $ 300
Bank's charge for arranging the $20
Total. $ 1800
Monthly payment. $ 1800/24=$75,85

-cash flow stream> +$1500 month and -$75,83 each month 2 to 24
2solve interested rate using present value for annual ratio founded
-75.83(P/a) exp .I..indice 24=7583(1/I)[1+I)[1+I].exp 24, 1j/[(1+I)= ,exp ,24 =1500
(P/a) exp.I . Indixe.24=1500/74,83=19,78
Assume an interest rate , I=2%
Error interest rate , €=19,78-18,91=0,87
find , errors,I=1,5%
€=19,78-20,03=0,25
0,87,indice ,I - 1,305=0,5-0,25i
I=1,612%
€=19,78-77=0,01,,1,612%

-data for cacul levilized cost
Year |annual cost | present value| Pres v
-. |$. |Factory. | P($

.		[I/(+I). Exp .n
1.	400.	|0,9091. |363,64.
2.	600.	|0,8264. | 495,84
3.	800.	0,7513. 601,04
4.	1000,	0,6330. 682.00
5.	1200	0,620 745 ,08

288,60..find accumulated depreciation each years
,sum j.d =[(1+I).exo -1]/[1+1).exp -1],, ¥.j=I.....n
n=2, accumulation is [(1+0,1)]/[(1+0,5).exp 5-1]=0,34398,
-annual depreciation expense,.dn=[i(1+I).exp n-1]/[1+1),exp n -1),, n=2, dn =[o,1(1.1) exp ,2-1]/[(1.1).exp 5-1]=0,18018

...

Explain: stationary batteries : 20Vdc, 1,2Vdc, current sizing constant power load 10kw , will be 116,lead acid battery with a nominal 1215 design , electrolyte for entire duty cycle ,<voltage , is 1,81Vpc ,
-calculation
1.open circuit voltage,start of open discharge.
Eoc=0,84+specific gravity
Eoc=0,84+(1215/1000)=2,055
2.)det >> average volt per cell during discharge.
=(2,05+1,81)/2=1,93Vpc
-
3)det average battery voltage ,
=1,93×116cell=223,9Vdc
4) compute the current at ,
1=1000w ,1223,9V=44,7a DC ,
Rated calculation
-DC input kW ,: rated ,100kva ,at 0,8 power factor ,of 0,91 ,, eff sizing
KVA × of ,, 87,9

-10000/1,81×116)=47,6idc ,, Nicol ,, negative
Positive plate =1,/2
Current positive plover ,,:1,75,,a 25°c ,4 positive ,plate ×70amp /positive =280A, DC

-number of cells 48 volt system (42-vdc to. 56_ vdc maximum.

- compute a cell nominal lead cell , 2.0 vdc number ,cell 48/2=4 cell
- check minimum voltage line ,= V.lim /cell=(min.volt) /number of cells
42V÷24cell=1,75 /cell

-incorect size .
Cell size (positive plate) ,
= Maximum ,s=N,, s=1,, sum .P=s,,O=1..Ap-A(P-1)÷R.t

-sizing batteries.,ampere capacity, energy electricity economic method ,data cost of electricity calculation.

-LIGTHING DESIGN:

Luminaire,height ,90°,
Pitagore triangle ,D,H,point
E=(Cd)(cos45°)/(14,14)(14,14)
E=14,14 foot candle ,
E=(Cd)(cos ,3teta)/MH.h
-food candles ,candle power /distance

E=average illuminance foot candle
N=total number of lamp luminance constitute
LL=rated lumen output lamp ,
LF= light loss foot ,
BF=ballast factor
TF=till factor
A=lightef area .

Find the level illuminance.
500lux (50fc)
750lux (FC)
Lamp: lumen rating,LX (maintenance)=1/2(L.L area ,750 LX ,

750=1/2(LL/4.).exo 2 ,=24,00LL,=24,00
Height LL=54.,00Lm,A 400w,40000lumen LLD,of ,,0,77

-layout out door lightning ,40w,- high pressure sodium, 20m ,wide × 40m long ,10m,pole 40m

...

3.20Explain : assumed power output =94,100kw,operating ,,KVA= assumed power output/power factor
=94,1000kw/0,85=111,00kva ,generating ,=operating ,,kva×1,1=(111,00kva)(1)=122,000kva,
-mechanical losses =700kw , generator loss =
operating ,(KVA)(k1)/100.k2=(111,1000kvs)(1)/(100)(1,0)=1200kw
K1=1,1.....K2.

-cher h value of generator power output generator output (94,1000kw)+ mechanical losses (700kw)+losses(1200kw)=96,00kw

-boiler feed and condensate pump.
Pump calcul power , kW=enthalpy increase across the pump ,(KJ/kg)×mass flow (kg/s) base value ,
ΔH=694,3-6748=19,5kj/kg,,
W=9959+164,5321
159445+55,752=398,687,,,
BFP=(19,5kj/kg)(389,687kg/h)
(3600kj/kWh)=211kw,

-condensator pump ΔH=172,6-171,7=0,9/kg
W=139,223+22,977+2383=164,583 kg/h
CP=6,9kj/kg (154,583kg/h)/(3600kj/kWh)=41kw
-det power consumption of elect motor
Electric motor power consumption = 41kw÷0,85=48,5kw total cp

- gross power output , sum turbine section power outcomes mechanical generator loss - losses , 96,000-700-1200=94,100kw
-net power ,gross power output - internal plan ,power consumption,

-feed water heater ,heater balance.
Write , balance for heater , 5×x line (4)×(100-line (8)]/100,line (6)×line (4)+(line (I)×line =line(I)×line(3)+(x+line(6), procedure is summarised,x =17,888kg

3.21 Explain:Lighting system for an indoor industrial area:

-a lighting system need design for a metal working shop area of the shop ,,12 m (50 ft)×60 m (200ft) conversation

---

Typical| typical| PCC|80|70|50|30|10|0
Lumin |intensi |PW|. |. | | |. |.
| Dist. |RcR|eff=|dn|up|lamp

LOw by| |
with
drop

High. |.
Bay
Open
Metal
Reflec

High
Bay
Open
Metal

Industrial while

,2×4,3 lamp trafficking

3.22 Explain: comparison of commonly used lamp type (HID type ,based on 400 - w ,size,
Lamp| initial|rate|lamp|Cu| burning| minut
| Lme|life| lumen| | posi|warp,hot
|Per. | |LLD|

Incad|20 |.100|0,89|high| any|0, o,,very,
Scent

Mercure|52,5|24.00|0,80|med|5-7, 3-6

Fluorescent|80|18.00|0,85|any,|0,0 low

Metal hol | 85-100|2000|0,75-80|higth

Sodium | 125. | 24,00 | ,0,90 | high ,any ,

Explain,
Characteristics of some popular lamp type
---__
Lamp type. | Initial | mean | rated | lumina

Incandesce| 320|. | 750 | 200
200W,A2
Insit frost
500. ,120V
500, 120v
1000,
1500, 130

Fluorescent|2950|2800|2000|6
Energy
saving
48-in
32wt8
---
9 Mercure
Phosphor

Called

Metal. | 41,00| 31.200|20.00|460
Holid
400w, 37
Clear

High
Pressure
Sodium
250 W,ED 18| 28.000|27000|24000|295

Explain:

LIGHT System for an out door area ,
Main height,
- highest illumination level produced away from a flood light location occurs when the maximum flood light candela value ,,
-3. Determine utilisation factor.
Area ,2 mainting height (2×10m=20m)
Height (4×10m=40m)long flood light is aimed ,13/10,

X÷MH=tan @÷cosπ

-Aiming line ,
Vertical angle , in line distance , maintenance,

-Lateral distance (x)÷maintenance (MH)

-foot candles /10.00 candelas ,
Mounting height =31,6ft,
Lux /10000 candle mounting height =10m
- calculat the level illumination
Average lux = (LL)(cu)(LLD)/area =(51.00)(0,4168)×(0,9)(0,95)1(20)(40)=22,7lx
-maximum averag Luz ,30,600w

Lumen distribution ,- isocandela , curves ,, photometric data for flood light in out door ,agree light design
---

Factor to consider : level for activity luminaire.
- light -loss factor light loss factor ,
-level of illumination, extensive information on selected appropriate
-ligthing source selection cost of energy to operate light .
-coefficient of utlization (cu) the coefficient of utlization important factor ,
- deternationof illumination categories

Level

A.public space. 30lx(FC)
B.simple orientation. 50lx(5fc)
for short visit
C.working space 100lz(10fc)
where simple
visual

Common visual task visual performance task commercial residential applications recommend
---
D. Performance of visual task of high contractor and large size. 300lx
E.performance of visual task high contrast
F.performance of visual task of flow contract ,500Lx(50fc),,,, 1000Lx (100fc)

G. Performance of visual task near
3.000 to 1000lx , 300to 1000fc
---_--_-
Point is long aiming line is located 63°,or 2MH,this point is between the 0,8 - LX and ,1.0 line ,so the value ,0,9 can be give point a is ,10° above the aiming,point of 53° this matches the isocandela curve ,marked 400,the candela value this problem ,400, substituting , formula point a yield ,
-lux = (0,9)(400/1000)(90.000/1000)(0,88)(0,95)(1)=27,0lx
Point B,is located at horizontal angle of ,42 and the vertical angle is ,10° substitute in the formula,
Lux =(0,38)(400/1000)(90000/1000)(0,88)(0,95)(1)=11,5lx
,point c

-Roadway ligthning system:
Information already that street width is 20m the mounting height is 12m and the over hand of the luminaire is 2m the required overage maintenance level of illumination is 16 LX it necessary to. To determine the stagger spacing required to determine t staggered spacing ,require to provide the specific illumination level as well as the uniformity bof illumination with.

- explain. mounting height used in chart is 10 m to calculate the level of illumination at any point following
Lux=[lux(from chart)](Cd/1000)(LL)/(LF)(LLF)(MHct)
-lux (from chart) =illumination in LX /100cd
-cd=candela value taken from the photometric data isocandela curves at the same horizontal and vertical angle as indicated by the chart must be corrected by dividing by 1000)

-total lumens falling on outdoors area lighting system.

Vertical. Zone	0-10	.10-20	30-40	40-50	60-70-to
0-10.	13,9.	14,6	13,9	8,1	. 58,6
0-10.	19.				53,8
10-20	6.				37,2
20-30	4.				27,3
30-40.	3.				18,4
40-50	. 2.				11,1
50-60	0,5.	0,5.	0,5.		

Total right side. 208,4
Left side. 208,4
Total lumen 416,8
Total lamp lumen 1000
_____&
Estimated
LF=lamp factor , which correct the lamp lumens used photometric data to the rated lumens used in the flood light in this case LF=S1,
LLf=light loss factor = lamp lumen depreciation times luminaire dirt depreciation
MHCF= mounting height correction factor ratio of the square of the mounting used in chart height used of the mounting use in chart height used in the problem in this case , MHCF=100/MH.H=100/100=1)

-luminaire shape of the room ,reflectance of the room surface factor coefficient type , sample table for six commonly,
+- 10% recommend value ,
-purpoae ratio ligthning system , function of cavity ratio
- section ceiling cavity ,CCR=5hcc(Lrw)/Les ,room cavity ratio ,RCR=5hRc(L+W)/Lw
FCR=5hfc(L+w)/lWs ,,

Industrial location and task(0)
Very important some ,blank = not important or applicable,
-weding
-orientatiin
-pieciasion Manuel AC
- inspection of work after
- Manuel craft
- cutting ,pressing
Design ,issue: apperence and Lyman , daylight integration,direct glare ,flicker on stroble,intrinsic ,flicker ,ligth distribution, light, luminance of 100, reflected faces object v,reflected , shadow,source task,note special

...

[

On Thu, 06 Jun 2024, 22:19 tshingombe fiston, <tshingombefiston@gmail.com> wrote: -E and w for 250-w ,HP's lamp,KL°28,00lm ligth loss factor for roadway ligth l

3.22 -explain : illumination at test point P1and P2

Contributing|. rate for test point
Luminaire | transverse|longitudinal|illum
| ration. |Motion. |

P1. ,P2, P1, P2. ,P 1, P2

A. ,1,5. 1,5. 3,75, 5 ,0,88 0,6
B.
C
D. 0,167 0,61. 3,75. Tot 0,78

Minimum illumination value of 0,6 Luz occurs at point value is the initial value per ,1000 lamp lumens to convert to the actual maintenance illumination level use lux .
Lux = [LX /(Min) (LL / 1000)(LLD) (LLD)(MHCF) maintence height correction factor vMHCF Cana read from chart
Find (06)(28,000/100)(0,73)(0,93)(0,69)=7,87lx , average to minimum illumination level is therefore ,16/7.87=2.03:1 max

4.

Section engineering 4.

- job design explanation:SPU
Duty
Design : calculation for electrical design ,
SPU: design standards and guidelines:
-4.1 introduction standard , established minimum guidelines requirements Generating electrical on project electrical
-load calculation conductor sizing, conduit sizing ,motor branch circuit sizing ,power factor improvement, transformer primary and secondary circuit sizing, voltage drop,motor starting voltage Dipa ,short circuit analysis , ligthning level , grounding ,in substation where step potential are of concern , harmonic distortion analysis, cable pulling calculation ,generator capabilities motor starting.

-software :the electrical, design engineering SPU, approved software tools are :
-SKM power tools window software,basic tools Doppler load curt voltage drop , conductor sizing harmonic analysis ,size ,and several power switch energy.

-center one available from Rockwell automation for laying out motor control centre , spreadsheet may also used

-Calculation for electrical design:

Calculati|desc|required|Req|cond|Eng|ph
| |Tool|

Load |load. |skm|. |. |. |. |. 30/60/9
Facility. | each|ptw|
Switch. |load | dapee|
Gear. |Center: per net determine bus |protective devices circuit size

---

Load| load on each|
Panel|panel board|
board|NEC to set to determine panel, circuit any transformer

Generator,| to size |car,koheler
Sizing| base on calcul on critical run and star run and start load

---

Short |available fault|skm ptw dapper
Circuit|current at each bus to determine equipment short circuit interrupting rating

---

Conductor| to sizing circt
breaker| breakers and fuses |table hand

sizing|

Conduit| to size conduit and cable tray per NEC

fill
Tray size |.

Transient| for starting
Motor. | Large motor
Starting|large determine

VFD, | for motor | 90cent
Reflective| from VFD

Wave

Lighting| may be performed specif
Protection|
Strike|
Distance|

- note suggested tools for use in SPu.
Projects
4.2.responsible party contractor -provided calculation may design engt - provide criteria
4.3.required conditionally requirements
4.4.basic requirements for electrical calculation
- non computer generated calculation must be on standard calculation sheet with the heading completed filled out
-calculation generated by computer programs must conform with the following procedure
-includ all heading information on each sheet ,
-insert comments wherever possibly to clarify to concept and actions taker in the compi input
- provide clear documentation of electrical geometry support conditions load application and load requirements,
-where practical , provide sketch of model indicated nodes , material , connectivity
- provide electronic copy on CD or other suitable device of analysis input and output with hard copy calcul
-provided manual checks of pertaining resultat.
.-coding liquid radiation force air ,
- voltage regulation: maximum allowable voltage dips
- operation prime standard
-voltage rating voltage ,non linear power factor with diversity multiple step of

-basic electrical engineering
Description: volts V=I×R,,power ,P=V×I,,P=I.I.×R
-AC single phase :
Volt ,= V= I×Z ,power factor ,of=cos π
Apprent power VA=V×I,reactive power VAR=V×I×sinπ
Real power=,,W=V×I×pf,,phase Angle ,Teta = arts (w/VARS)
-Power , phase angt ,Teta art (w/VARs)
Power factor , of = w/ (V×I)=w/A
-voltage drop ,Vd° 2×(I×R×cosπ+I.xsinπ)
Vs= voltage drop in circuit ,sin π= load reactive factor,
X= reactance
-AC , 3phase : KVA = (V×i×√3),,

KVA=√kw.kw+kvar.kvar
Real power ,kW= KVA ×cos, reactive power ,= kvar = kva×sinπ
Vs= voltage drop in circuit ,sin π=load reactive factor ,
X= reactance.

Motor , 2 horse power = 746 watts
- conditions a motor control centre with a total connected horse power 337hp CA be assumed to requirements ,337 KVA of input power conservation value large motor
Torque = (HP × 5250)/ revolution per minute (rpm)
Fan go ° (cubic feet per minute [CFM]×presure)/(3300×eff)
Pump ho = (gallon per minute [GPM] ×heas×specific gravity /(3960×eff) .motors (single phase .
HP=(v×i×eff×pf)/746
...

-4.6 explan ,HP= (v×i×√3×eff×pf÷746)
-sizs the capacitor need to increase the power factor from Pf1 to Pf2 with the initial KVA ,,
KVAR=KVA×(√1-pf1.pf1-pf1/pf2
×√1-pf2.pf2)
- load calculation sizing NEC 229,430 feeder conductor and protective devices , transformer panel board and switch board main busses motor control centre components service entrance device and conductor,
-load calculation must include all load ,the should be made by summing all of the load using appropriate diversity factor allowed by NEC art 229 ,that are connected to each panel board , switch board ,and motor control centre ,an allowance must be made for future load , growth the load for each branch of distribution system can the summed ,back to the service

-Generation sizing : software generator single or multi sets must be sized to supply maximum starting (SKVA),stead - state running (RkVA) and non linear (Gkw) demand of connected and future electrical equipment.

- information critical to the sizing and selecting.
-det include.
- environmental conditions elevation temperature indoor , outdoor
Noise obtatement requirements , muffler , enclosure silent ,
- fuel diesel gasoline nature gas
- fuel storage skid mounted tank ,day and remote tank
-
4.7 Explain conductor size ,general:
-general purpose branch circuit and feeders. ,art 220
-service entrance conductor ,art 239
-motore circuit. ,art 430
-air conditioning equipment. ,art 440
-generator. ,art 445
-transformers (primary and sect
-capacitor

4.8 Explain general requirements: sizing conductor two step process .
1.step is to look at the temperature rating of the terminal ampacuty of conductor be used match temperature rating.
2.the second step to look at the effect of ambient temperature conductor derative factor ampacuty
-inaulator used to cover wiring rated maximum temperature continuous , standard rating are 60,75°,90°,and 105°, current carrying capacity conductor.
-croas -section of the conductor , insulation temperature rating ambient temperature, copper 90°, test lab switchboard panel.
-load rated 43A, conduct containing conductor load running area ambient temperature high 42°, conductor are ,to copper THHN/RHWN insulation
Ampacity required=continuous board ×125% or 53,75 amp ,6 awg copper conductor Havit ampacity of amps correct terminal the circuit breaker services load houtsw , 31-16 , applied max. Temperature exceed 30°c ,
- Ampacity 6 conductor (THHN/THWN ,wet 75° Colum)=65amp
- corrected ampacity = 65 ×correctiin factor (82)=65×82,
  53,3amo

Load of 200kva existing at 480V, with a power factor of 80% determine the amount of capacitor requirements factor to 95% =of=kva÷real power (kW)

-sizing procedure generator single multiset.
- prepare a load schedule,enter individual load characteristics in software,enter load in step

sequence in software enter load in step sequence in software
-have software calculation
eff=efficiency,FLA = full load Amp ,GKw=non linear kW of connected load (s),LRA=locked rollor amp.
RPF=running me of connected load,RMA, reduce motor , starting factor ,SKVA=starting KVA of connected load (s),Skw=Starting kW of connected load (s) spf =starting power factor of connected load.

-resisti e loads : SKVA=RVA=Skw=Rkw
-ligthing loads (except for HD) ,SKVA=Skw÷Spf, RkVA =Rkw=RPF
-GID, ligthning loads = ,SKVA =0,75×RkvA, Skw=0,75×Rkw
-motor loads :SKVA=NEMA ×hp×746÷eff×spd×10000
-motor load 3-phaae) SKVA ,= LRA ×VL-Vl×√3÷1000)
VfD: Rkw=(drive -namwplate (HP)×646÷eff×1000
RkvA=drive -namw plate (HP)×746÷eff×pd×1000
SKVA = drive - name plate (÷eff
V.fD: Gkw=2.0Rkw
UOS: SKW=(ups-name plate (kW)+battery charging (kW)
RW=ups - name plate (kW)+battery charging (kW)÷eff
-ups GKW ,(3pulse) =2,50 §Rkw
Gkw(6pulse)=1,40×Rkw
Gkw(12pulse) 1.59×Rkw
10.reduced voltage motor starting SKVA=skva÷ RMs f
...

[

-Kva at initial power factor =√(KVA).(KVA)-(kW)(kW)=√(KVA)(kV)-(kva×pf)exp2,
KVAR=√(200kva)exp2-(160kw)exp2,kvar=√40000-25600=120,00kva
KVAR @95% power factor = √kw÷pf)exp.2-(kW) exp2-(kW).exp 2
√kvar =√(160÷95),exp-(160)exp,,
KVAR = √28,366-(25,600=52,6
-requires kvar for correction=120-52,6=67.4 kvar
-nec 460-8 criteria must met when sizing branch circuit conductor to capacitor first the ampacity of the conductor must be at least 135 the rated current of the conductor must be at

least 135% the rated current of the capacitor second,if the capacitor are connected to motor circt the conductor to the capacitor should have an ampacity not loss than on third the ampacity of the motor
branch circuit conductor , capacitor rates amps=15÷(48×√3)=18
-branch circuit amp =18×1,35=24,4minimum ,motor branch circuit amp =1.25×77=96,25
N0 I,AawG at 110Amp a 1/3 of motor branch circuit ampacity =110/3=36,7Amp.

- 4.7. explain transformers: primary secondary,art 450,600v, nominal electrical system design nominal,feeder breaker , sizing 250%
-Assume ,45Kva ,3phase ,480 v , primairy 208/20,
-primairy full load Amp ,45kva ÷((480v×1,73)÷1000)=54,2Am
Feeder breaker and conductor ampacity.
54,2 amp ×1,5=81amp use ,90 amp breaker ,3 AWG copper.

-calculate secondary full-load amps , 45kva ÷ ((280volt ×1,73)÷1000)=125,06Amp, calcul secondary breaker size conductor ampacity at 125% secondary full-load, 125,06 amp ×1,25 =1563amp use ,150 amp breaker no selection copper conductor,
- note this selection limited th3 continuous load that can be suppli%×208vol×150 amp , 1,73 to 43,2kva ((80×208volt ×150ampx
-condition assume ,a 25-k a ,I-phass transformer with 480 v , primary and ,120/240-v secondary Full load Amp (25kva÷(480vol÷1000)=52,1 amp
-required feeders breaker size and conductor ampacity,52,1 Amps ×1,5=78,1 amp , use 80 -amp breaker and no ,3 AWG copper conductor , calculate secondaire full load amps ,
25KVA ,÷(240 volts ÷1000)=104,2 amp

-required 104,2 amps ×1,25=130amp,use 150 amp no

-voltage drop : feeder and branch circuit ,
Vs =IRcos+ix sin , vd = volt drop in circuit line
I=curre flowing in conductor,R= line resistance for one ,angle whose cousin load power factor ,cos Teta =load ,L=load reactive power.
L=Load reactive power.
=AWG copper conductor feeding a Motor rated 60hp,(77A full-load) 3 phase ,460 v , through Regis metal conduit with a circuit length of 520 feet assume ,that motor power factor is 85%<
Volt drop =((520feet ×77amps)÷10000)×2,55volt =102volts.(102Vac÷480volt) ×100=2,13%drop

- motor starting : 20% volt ,level 15%

-short circuit:

Condition load will be served by 1500 KVA transformer ,a 480 ,3 phase a single phase control center the fault current availability from the utilities on source side of transformer is transformed impedance on source side ,of transformer is transformed impedance is assumed to ,5,75% base data , approximately,7,5% of nominal , 5,75%×((100%+7,5%)÷100)=5,32%

-short circuit: condition the load will be served by a 1500kva transformer at 480,3 phase through a single motor control centre the fault current availability from the utilities on the source side of transformer is unknown ,the transformer is approximately,75% of the rating of the transformer note that standard transformer impedance is valued at +1-7,5% of nominal , therefore a conservative calculation the lowest impedance should be used
5,75%((100%-7,5%)÷100=5,32%
-the current flowing during a fault at any point in an electrical system is limited by the impedance of the circuit and equipment from the source or source to the point where the fault has occurred for these simplified calculation we will assume that only source are the transformer and the motor connected to the system the motor are connected in parallel with the transformer as an impedance with an infinite bus as the source of the fault current
- short circuit current= driving voltage /total impedance (ohm,
A point -to- calculation of short circuit current available at any point can using it the basic used per unit calcul short circuit
-value in electric power circuit the reactance of the utility systeme must be assumed zero ,and the following
-approximate transformer per - unit ,Z=(%Z)(base KVA)÷(100)(transfo KVA)
Base KVA = transfo KVA
Per - unit Z,of t transformer=%Z/100
The basic formuler calculating short circuit current when per unit ,
RMS ,sym = base KVA ÷ (1,73×kv×(per - unit Z of the transformer.
KVA = transformer KVA and transform ,KVA ÷ (1,73×kv)load current for three phase transfo ,
ISC ,RMS ,sym= transformer ,FLA÷(%Z÷100)
-Transformers flat = 1500Kva÷(48×1,73)FLA=1,80,
ISC,RMS,y=33,955am

-the rotor construction to fault by single or group of low voltage induction motor can approximately five time the motor full load current this because the reactance of a low,voltage induction motor , including the made as above for a transfo motor load ,75% of transformer rating rating was give ,motor FLA,
1,806×75=1,355Amp, < I,c RMS ,sym = 1,355×5=6775 amp
-total short circuit current available point fault the total of the contribution from the transformer plus , construction for the ,
Total ,I,c RMS , sym = 33,955+6775

4.8 Explain :Lightning: ,2 method ligthning levels in a space the lumen or zonal cavity method and the point by point ,zone cavity method is using calculate the average foot candle level with the space ,point by point method predict illumination for a specific visual task
-design a lighting system for a room 15feet×25feet with a ,11 foot curling that will be used for general office work ,the ceiling will be lay - in - ceiling title and the walls will be ,painted off white the luminaire will be cleaned regulation and lamps will group replaced when the first failure start occure,
-Foot candles = total lumens striking area÷area
-Foot candles ° lamps × (lumens ÷lamp)×cu×LLF÷area
Cu= coefficient of utilisation, LLf = light loss factor ,

PFC. 20
PCC. 80
PW. 70
RCR

Test No 7834, S/M=1.3
- the work plane height is the level at which most task performance
30 uncles , RCR= (2.5)(11-2.5)(2(15+25))÷(15)(25)=4,53
From the Cu ,table above see bold number ,the resultant cu must be interpolated between 9,55 and 0,50

100=No .for.lamps ×3150×0,523×0,75=15×25=no of lamps = 30,4@4 lamp
,-0,75 foot candle level,number of applications work ,level ,100foot candle,
- spacing across room = 15÷2 ,or about 8 feet
-between row and (15-8)÷2,,3,5 between wall and closer luminaire all dimensions are to centerlt.
- spacing length of room = 25÷4 , or 6 fleet,
-between luminaire in the row and (25π2,or ,,3,5 fleet room,the wall to the end luminaire.
-foot candles =(8×4)(3150×0,523×35÷15×25=105,4 foot candle.
-ligthing point by point calculation
-cable power distribution curve

4lamp

Angle. |End|. 45°. Cross
---
0. 3429. 3429. 3429

D=,, R=4, H=8,5'.

Foot candle (horizontal plane ,
-FC(h)=candle power ×cos π÷distance
-FC(v)=candle power ×sun π÷distance
Candle power(cap) is source in the direction of the rat , cos Q = height above task (H)÷ actual,distance from task (,D)
Sin Q =horizontal ,distance from task ,R÷D
D= √(H.H+R.R=√(8,5)(8,5)+(4)(4)=9,4
FC(h)=√3245×0,904)=33,2f
F=√(4)(4)+(6)(6)=7,2ft.
Cos ,Teta=H÷D=8,5÷9,4=0,904,,
Arccos (0,904)
-F°√4(4)+(6)(6)=7,2..f.t
Cos,Teta=8,5÷11,14=0,76,Teta =arc ,0,763=40,27
,45° respect luminaire ,35°, 45°,value use , 2420 candle power
FC= (2420×0,763)÷(11,14)exp2= 14,88 FC
- FC total = (33,2×2)++14,88×2)=96,16fc

- ground:
Cale pulling tension:
TM=0,008×n×cm
TM=maximum tension in pound ,
n= number of conductor in cable
CM= circulator mil area
T= length of duct [feet) × (weight of cable (lb per foot)×(coefficient of friction)
- R = T÷ 300, max pulling tension ,1000
Pounds cables pulled basket,300,time ,R= T/300,,T is the work

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Equipment heat load ,heater electrical losses estimated added to cooling requirements of the save energy y loss for number of type of electrical equipment .
Losses in electrical equipment

Components.| Percent ,energy,loss full L

-meduim. | 0,005-0,02
voltage.
switchgear
- transformers |0,4-1,90
-meduim. |0,02-0,15
Voltage

Starter.
-low,volt
Switch gear. |0,13-0,34
-low volt
Motor control| 0,100-0,49
-cable.
-motor
-1-10hp. | 14.0-350
10-200hp. |5.00-12 .0
200-150ho. |4.0-7.00
Static |500-15.0

Variable
Speed drive

...

Section 5.

Assessment moderator , learning and teach ..

5.1 Explain: teaching modules material balance energy and heat transfer.
5.2-engineering systeme.
- dimension of mass flux mass flow per unit area perpendicular to flow .
G=1/A×dm÷dt.
Dimension are M÷L.L.t
6f.t+10°c
5.-1.3 conversion of units
-5.1.4 . process and process variables operationel or series of operation particule , objective is

accomplished.
Operation involving a physical or chemical charge in a substance or mixture of substance material a process an input or feed ,leaves is the output or product ,process variables associated through input or output of a process stream .
-construction
Draw of simple block flow diagram representing ,calculate the Quantity of mass ,or mass flow rate ,volume ,or volumetric flow rate miles flow rate ,
-explain , gram mole ,lb and ,at least two density and molar mass ,
- explain : the meaning of gram - mole Lb
- least two methods of measuring .
- convert a pressure .
Convert amount .
- process is any operation or Serie of operatio that cause physical or chemical change
-process , input fees yes ,process yes, output product,
Process variables ,temperature pressure flow rate composite.

-Mass and volume substance ,kg /m.cube, g/m cube, Lb.ft
Calcul the density of mercury in Lb/Fr, tabulated specific gravity of Mercure in lb ft from tabulated specific calculate volume ,specific gravity of mercury at 20° ,
PHg =SG×pref
= @3,545×62,43Lb/ft ,exo 3
Volume= 215 kg | Lbm. |ft exp 3
|0,454kg|45.67Lb

- flow rate process involves the movement of material from one point to another the rate which material is transported flow rate of material the flow rate of process stream be mass flow
Or volumetric flow
m,kg , fluid
V,mcub fluid
u (m/s,
m=P.v,,
m=P.v
Average linear velocity ,u= v/ A=m Moli flow rate ,n= m÷ M.. weight,,
M= molar mass (molecular.
-chemical composition , material in natural in chemistry process system are mixture of various species,
-physical properties of a mixture strongly on the mixture composition.
.-moles and molecular weight: atomic weight of elements is the mass of an atom.
Moles and motor mass , moles ,n=mass÷molar mass=m÷M
- carbon monoxide (co) has a molecular weight of 28,1 mol of c there contains ,28g ,Lb mole

contin ,@ ton - mole contain ,28 ton factor used ,

100g.CO2| mol CO2

| 4401gC02
-mass and roles fraction process stream occasionally contain on substance , mixture of liquid or gases mass fraction ,mass of components per unit mass of total , mixture ,XA=mass of A÷ total mass (kgA÷kf total , or gA÷gtotL ,or LbmA÷ Lbm totaj
-yA=moles of Aπ total roles (kmol A ÷ kmol total ,or mol A ÷ mol total total
- solutions containing contain 15%, by mass (xa = 0,15) and 20mole%, B (vb= 0,29) ,a calculate the mass of A ,in @74 kg ,solite
-15kg solutions | 0,15kg A
---=26,25kg,A
| Kg solutions .
- b ,calculate the mass flow rate of A in a stream of solutions flowing at rate of 53 Lb/h
53Lb| 0,15 LbA
---= 7,95 LbA/g
H. | Lb

C) calculate the molar flow rate B in stream flowing a rate of ,1000 mol

- 1000mol|0,2molB
---=200mokB/min
Min |. Mol
-calculate total solution flow rate that corresponds to a molar flow rate of 28 kmol B /s .

28kmol B. | 1kmol solutions=140kmol

|0,2 mol B
-calcul mass of the solution that contains ,300 Lb f
300LbA. | 1Lb solutions
---=2000Lb
|0,15 LbA
- concentration the mass concentration of a component of a mixture or solution is the mass of this components per unit ,volume of the mixture .
-mass concentration=mass of components or solite ÷volume of mixture or solution = g÷cm,Lb/ft,exo 3 ,kg
- the molar concentration of components is the number of moles the components per unit volume of the mixture.
Molar concentration = moles of component solutions ÷volume of mixture or solution= (mol /cm

cube,lv-mole/ft,exp 3
-the molarity of solutions is the value the molar concentration of the solute expire ,
Molarity= moles of solute ÷ volume in liter of solutions = mol
Molar a aue ,solution sulfuric acids flow into a process unit a rate of ,1,25 m cube /mib
the ,specific gravity of solutions is ,1,03 and molecular weight of sulfuric acids is 97,08
a),the mass concentration of ,H2So4,in kg
/m,cube ,=0,5mol.h2so4÷L×98g÷mol×1kg÷1000g×1000L÷1m,cub=49kf,H2So4.
b)the mass flow rate of H2So4.
=49kgh2So4÷m3×1,25meter cube ÷mib×1mib÷69=1,02kgh2so4is

...

section 6

6.-explain: proposed gate RL, architecture ,
A. Proposed gate RL, systeme is based the RL, methodology that consists of agent and environment agent send ,to the environment add new connection to the schemat to environmental add new connection to the schematic ,envit update ,state (St+1) reward (et+1) and mask (Mt+1),transfer them to the again ,RL network ,gate RL ,make action masking

-mask ,Mt,Mt+1,, reward,r1,r1+1,, agent, thrust, environment,,action
-is extracted connection matrix (cM) that is similar to and adjacent matrix graph their all possible node schematic are equally assigned ,now ,CM ,shaa of square ,matrix ,N1,No,Nn,and No,are number of input , output ,n type ,Mo's (NMOs) transistor and P type Most ,(PMos) transist ,respective ,total number of columns ,or row ,Ncm can be connected to suppi voli source of VDD and GND ,,in particular transistt have ,three termit of (s) gate ,and draw ,D ,the number of their nodes are calculated by means ,number of transistor factor factor of ,3 the connection body are omitted..
-transistir are fixed GND ,and VdD , respective from the node assigned to I th row ,or colour ,is address as ,the odd ,(@=1,2,...
NCM=2+N1+No+3Nn+3NP.
.
Drawn..

-6.1 connection Matrix (cM) configuration ,C m ,an element of CM at ,ith row the Colum (I j) ,is assigned to ,00@,mean connection.
N1,No,Nb ,and ,No ,are ,1,1,1 and in addeditiin ,connect in the circt schematic are indirect ,CM ,is constructed , symmetrical matrix..

- state ,stmmt CM does not allow self connectiin VDD,GND ,input and output ,the marked. Information ,(s) ,into state vector (t) ,22mask (Mt) ,
m,0 if available , connection between node I and ,node j if , in = (1, prohibited connected bett node I ,and node .

- CM ° (in) she < I < NCM j NCM , without connection node ,I and node j , C in = { with connection between node I and node j ..

Drawn
-6.2 extraction connection of circuy element ,constray direct connection bett VDD,GND,,iNPut,output ,must sout and to connection of circuit.
- circuit least diagonal elements (ci ,,I= @,#,NCM(,fixed at all the time , symmetrical matrix the full matrix can be reconstructed ,half area ,shape ,
-circuit leading to the diago elements ,(CIR ,I= 1,2,N , reshaped ,into St ,in a form of a vectt by flattu it length (Na) is calculated ,dividing rectangular .
(3Nn+3Np-1)(3Nn+3Bp),exp 2.
=(2+Ni+No)(3Nn+3Np)+_____'''=Na
3(Nn+No)(3Nn+3Np+2(2+NI+No)-1.exp=
3(Nn+No)(NcM+Ni+No+1)

-draw maskit matrix (MM) generated with , VDD,GND ,input , output ,node ,terminals is connect to VDD ,GND ,or input ,termit ,the ..

-marking t exit connection ,
- marking connection bett VDD, GND,,inp ,
- marking connection ,via a transistor between VD,D marking connection of single both source draws ,
- mask generation scheme base on a given CM ,N ,M generated according to four masking criyert the red is of matrices middle are exit connection ,CM ,blue is are possible , connection via other node ,each masking criterion finally ,two vectors of St and Mt ,are produced by flattening the upper right region ,CM,,and ,MM respective,,

-rewa

...

-6.2 reward (t) since proposed gate RL ,simple defined,+1 correctly workings schematic ,-1 other expected the gate ,RL proposes the working schemat Witt the minit , number of connections steps minimum
- inverter combination two point , combination of two input (N1,N2) target out (out) ,case of -1 and +1 the four row composed aget , support two logic gate such and ,and ,or ,nor
-gate ,RL framework ,level of VDD low GND,,

.draw

-keep one input gate ,N2,high impedance ,0,1 is VDD ,and -1 , GND verification is conducted ,CMos transisi ideal switches andP MOs ,complt gate value ,+1 and -1 respectively over ,first a vectt (SV) of the size ,of 3 Nn + 3 N p, initiation

Draw.

6.3Verification step inverted ,are matched to target output ,out ,is decide as ,1,
Action (t) .
Agent is implemented by deep ,A- network (D AN) 4,fully , connected network (C1 FF) ,C 2,C3,C,4 takes concentration ,St and t as the input layer x is the flattened ,vectt give, range ,St value is charge from ,T activities rectifier linear units (Telus) ,C @,C,2,C,3
Scale ,(B) is struct , guarantee to mask , element,is decide selecting position of maximum output , org max ,function with respect to action
X= concatenate (2.st-1),b FC 1= rely (w1.x+1).b
fc2= rely (w 2.fc1+2).b fc3.= Rely(w3.fc2+3)/bfc4=w4.fc3+a,t=orgmax (fc4,B.Mt)

Draw , ..
DAN Struct it deal with concatenation of St and T as an input layer the range of ,St elemu from ,0 to @ ,is extendt from -1 to ,in order to be matched ,
- elements from 0 to 1 ,is extent,
T,t and RT +@, return (GT) at ,St revised replaced appended to replay buffer ,changing R ,to

address ,all target logic gates , agent ,DQN, mini batches,
- D QN ,funct ,W is weight and biases , is the discounting facty and the learning rate ,
L= sum + sum + G(St ,T,t) ,2 ..
------_____
- algorithm ,DQN
1:for each episode do
2:for each t dib
3:
Initialize CM,I
,aegma.
€:t
and Mt,with probability ,a { Q(St,T,a)-BMt},and Mt,or Mt

,2.1 ens for ,
2.2 end if .
23: end for

...

7. Explain: part stared in electronics ,from electrons ,to electronics , keeping humans ,gadge safe ,
- components shack ,stocking up outffiting your electronic bench
- getting common electronic components
- filling out your part bin
- putting on papper.
- reading a schematic
- underst the basic of electronics circuit .
7.1.4. Getting , soldering ,making friend with your multimeter , getting down with logic ,probes and oscillated ,

.
- part pletira of project ,
- creating your own bread board circut ,
Built your own printed circuit board ,
- the exciting world ,if microtrollee ,great project you can build ,30 ,
* Ten cook electronics testing tools tips .
- ten great electronics part source ,ten electronics formuler
_____
- parted getting started in , +5volt ,0 volt ,signal ,volt signal ,DC square wave
To be come electronics decide wath to build create board Brea circuit jump right in to project
- discovery circuit ,team ling ,
- play with tools to build thing
play w
- if you design a circuit you want building thing make more get soldering pencil ,also called a soldering iron ,the elements of a circuit together choice a soldering pencil.
- you work with project,no doubt other miscellaneous tools pop up that you may ,want you can use ,magnet to retrr screw and other work bench
- tools to measure thing ,
- unitt smiles and bigget .
- current ,OA,nA,mA,uA,A
- inductance ,: Ng,mhuh,h
+5 volt
9 volt with capacitor with caoacit ,
- understand ohm low ,wee wiring a circuit sat know the amount current that the components can with stand blowing up ,how .
V'=I×R.
Taking ohm low father ,I= C/R,,R= V)U,
I= V/E=12/8,= Colts /ohm=1,3 Amo.
-the pou of ohms low ,O= V×i
- can use equation to calcul the power by the buzzer in previous,
O=12volt × 0,095:Amp = 0,962 watt
And you thoug Mrs ,what sir wasted your time in algebra all years , because ,V= i×E,you substit ,I×R,
,you can to rearrange the equat for lower show how ,gadgt sage ,
& Six sens of electronics isn dead people living common sense is that voice inside ,never assumed always double check ,pretend that your soldering bpencik is out get your burn or electrocute your self .
- if your not sure about how to do something read up on it firs , everything in electronics , take chance make ,40/59 something is plugged
& Danger of electrical shock ,electricity = voltage + current

- components shack : stocking up
Our fiting your electronics bent
- take it off wire cutter and stripper name off the wire plastt insulation.
- gettt a grip wit needle - noses pliee ,stripes bend wire and hold pasrus ,place during project assembt for intricat work ,use ,5 - inch needle ,nosed pair of pliers such as jewellery makers usedarger pliers ,such general purpose work ,way the size of the pliers reflection the overall dimensions.
- magniful ,alligator ,nilkon trim cutter wire flush .place for everything and everything in it place .

- filling out the box time to time you workshop tools when construction an electronics project .
- probably need a saw or drill building motorized ghost display ,don't thing you have to rush out an by one evry tools .
- Clow homer ,: used for just about anything you can thing ,.
- rubber mallet : for gently bastinf piece together ,hacrsaw to cur any.
- miter box , to make anled cut with you back saw mete box include ,a 3-4 flat where your place .
Adjustable wrenches ,sometime crescent ,locking pliers ,such a vice grip ,the lockit ,nechanist help hold piece for cuttt sand ,but driver tools ,make it easy it , easy for machine screw ,
Measure tape ,get cheap cloth tape at fabrication store ,
File assortment ,use these file to smoothly the dough.edge of cur wood ,metal
and ,plastic.miniature files at the hobby store,.
- drilling motor , working with metal and plastic.
- drill bik fly duty in Tricare work Hans ,operated electronic ,
Drill bit assortment.vixe safer clear

...

[

- explain: transistor, on the case of transistor plastic or metal , size matter ,
Condensate always observed the polarity marking on capacitor , changing capacitance .
- diode semiconductor use control flow of electronics semi conductor a diode had two terminals.
- zener ,ligth , emitting diode silicone controller rectifier.

,- rectifier ,brigth.
- AC, input ,DC out put ,PIV , rating rougth indicate the maximum working voltage ,diode rated 100volt , current rating is the maximum amount of current the diode withstand ,3 Am ,
-diode are identified industry standard numerical , systemnclasic is the IN 400 rectifier diode which rated rated out ,2.0 PIV ,and 50volts A,1N4002 is rated at 100volt ,IN ,4003 rated at 200volt and , which way ,
- resistor , meeting LEDs,
- circuit voltage | current limiting
3.3 to 5 volt. | 330ohms
6to 9volt. | 560ogm
12to 25 volt | 1kohm

-R=(vs-vf)/if..
R: resistance.
Vs: represent supply voltage ,voltage,
VF: drop Led.
If: in Amps

- 7.3explain packing parts together on integrated circuit discret component mean separate Icb.
-linear digital or combination plate lineare ,connection required:
Call pins
number counter clockwise,IC-14pin,IC
Clocking mark : IC pin number counter clockwise , sequence staring from the upper left the clocking notch orientation the child ,at the ,12h 0' posit.

-Filing out your parts pin
- picking the perfect type of wire powering up with batteries and solar cells , flipping switch , controlling output with logic gates , tuning signal with inductor and crystal ,marking Sens of things with sensor , exploring how DC motor working ,making some wmaking connection Components schact stacking up .
-marking connection : marking a circuit requirements that you connect component to allow electric current to flow between the the following sections describe wire cables and connectors that allows you to do just that
-wire use electronic project long strand of metal or copper ,on job cut open the cord of any old hold lamps make sure ..
Insulation .
-sizs matter wire ,
wire gauge /wire diameter
16. /0,051

30. /0,01

-color.
Making connections with connector typical cable ,call socket or jack ,pins and holes connect the appropriate wire in the cable to corresponding wire in the device.
Cable to the corresponding wire in the device.
- connector run into electronics a terminal and terminal
Block work together type block attachments block to the case chassis project solder crimping a wire to terminal each .
- to connect terminal wire pic a pair of screws and connect.
The terminal each wire tone those screws.early project

-powering up : all wire and connectors have a power source building a project nee Voltage and current thing get power ,from wall outlet we talk about plugging in wall outlet , batteries solder .

-electromechamicsl reaction process turning juice.
- starting you everyday type batteries that ,supermarket ,AAA,AA,C ,D ,size batteries all produce about ,2,5 volt compare to the transistor battery ,(little , rectangular.
Negative terminal ,,positive terminal,, rechargeable.

- zinc - carbon ,alkaline ,nickel ,-cadmium , Ni cad ,Nicad,
- Nickel - metal hydride (Ni-MH). lithium

Drawn

-turning electricity on and off : switch disconnected wire the batteries run from the batteries to ligth bulb , connection wire to allow electric current to flow or disconnect wire
Toggle ,rocker and slide switch ,dobsame job , switch works well array ,

- hand held flash light because of the position of your.
- thumb ,but a toggle switch may work best to flip on a gadget sitting on your workbench
- want to see le of switch in action ,#5 described you used leaf switch , normally closed (NC) ,push - button switch disconnected ,wire only when you push the button .
- normally open (No) , this push - button switch connect the wire .
- push on push off (button ,this switch connector the wire.
-wath inside a switch ,call basic switch that we talk previous , section single ,pole

single ,throw,SPST,,types ,
- single - pole double - throw (SPDT) one wire come in two wire leave , green ligth to let people.
- double ,pole single through (DPST) ,two coming into control two separate circuit , running on 5 volt another ,
-double , pole double ,throw (DPDT)..

LEt a relay flip the switch : simple electrically power .
gadget 5 vol, 117volys power ..

Out put wire , 5,12,or ,24 vdc to power ..

7.5-make decisions with logic gate : play
Comput ,or input invert / input / output

_____
And gate input /output

Input A. Input B. Output

Low
High

- vibration with DC motor
Speaking of sleeker
Building super duper
Buzzer noise get.

-understanding the roles of of schematic getting to know the most Comme ,using and not busing components polarity

-what schema to be care , schematic serve main purpose
Show to reproduce a circuit shown you can build the circuit shown interconnection ,give you overview of of a circuit so that you can better understand how it works, discovery how to read

little learn foreign language.

-symbol power ground ,line horizontal , ,117 VAC , outlet DC , battery low ,no ground symbol metal chassis ,,
Make Laball DRA

-connect ,unconnect ,,,jack plugs ,and connector , miscellaneous

- basic circuit electronics: series circuit , parallel you can connect if you,

RT=1÷1/220+1/33+1/10+1/330=7,2ohm ,
I=V/R=9volt/7,2=1,25Am

-voltage dropped across R1=R2/R1+R2×Vt=220÷330×9V=6v.
Bout = Vin -VR2=9volt - 6 volt = 3 volt ,I = ,V/R=2/1=2a.
Team building of basic block of electronics circuit , such as , time constant ,= constant = R×C = 2000,ohm × 0,0000015 farad = 30 sec ..

- using transtor is a switch , boosting ,thing with a basic amplifier .

-An operational amplifier ,IC , op Amol .
Gan = R2/R1.

-R2' is ,10 times ,R 1, the gain is ,10 ,this gain result in a ,2 - volt input signal producing a ,10-volt out signal .
- An op - amp both negative and positive supply voltage .
Range ,8 to 12 volt negative supply voltage in range ,8 to - 12 work

...

-7.6 integrated circuit: ,
A,555 timer IC wred into a circuit make more of less ,pin number you used ,connects to pin 8

which ,power and pin 4,which ground connect to pin 1,the output of IC ,St pin
-filing pin 2,and 6,pin 7 , discharge,R2 and R 2,
T1=(R1+R2)×c , T= (R2)×c.

7.8-solder getting industries :
Soldering tools.
Soldering pencil pencil insulating tips iron takes,soldering pencing ,stand solder ,
- solder hardware,
- wettedspongr ,sipping off excess solder ,
-4×to6×magnifying glass for inspecting your work.
Solder sucker , removing excess ,solder.
-rosin flux remover available in a battle ..
* Third hand ..

- making friend with multimeter.
Basic multimeter ,valt metr (VoM) is the basic tools for test measure AC voltage measurement resistance , measure current going through a circuit measure continuity
Digital analogue,
electronics 12bit.
Discrete step ,step can take any analoi signal circuit , Meyer manufacture select,
Manuel
DC volt ,1000v,AC volt500v ,DC current 200mA, resistance ,2mohn ,

Test output voltage ,, supply voltage ,test switch ,test resistor capacitor ,
Logic probe use ligth to indicate a low or high sign ,logic led indicator,
Testing the frequency of AC ,60 Hz ,50 Hz

2/period = frequently,
2/1,6=0,625 ,see time phototransistor wave for ,span ,, 0,8 a division , 120 flash ,,1/0,80= 125..

- Pletorate : project couple of circuit board constructy point - to - point wiring , wrapping ,
Taking a look at soldering ,bread band ,styless,
- title silver,metal connect , resistor , capacitor,transistor,IC
Bread board consider of columns that connect electrical
- Pre , stripper wires.
Building your own printed circuit board .
- printed circuit board is mode of copper and on insulating
- finished PCB , use pools for soldering on components and traces in place of wiring .

-manufacture make circuit board .
- first the coal the copper with a ligth , sensitive chemical layer called the sensitizer know a resistor ,Photo resistor
-;next the place exact ,size film negat of t circuit board layout drawings over copper clad expose ,expose ,processing board in ligtg in case strong ultraviolet light..

-after exposing the board the dip it in resistance development this messy stuff but a necesst , development copper turned black or a dark Gray positive .

_as final step they dip the board in etchant ,
- step build choosing right copper clad material that you to make ,printed circuit cladding square ,35 micro metre ,cutting and cleaning board use make PCB ,

-created PcB , photographic.
Prepared a mask of circuitayout and transfer it on clear transparent film variety of methods as description section.

- use mask to expose a sheet of sentived strong .
- dip the sensitizer,exposed sheet into a development.
- submerged the copper sheet,tray of .
Flip flop create

-ligthing effect projector...

- cool robot project to amaze :
Rover robot list ,
Bottom deck ,cut to size ,top deck,cut to size ,2 Tanya ,worm gear motor (model ,#72004)
- 2.tamya narrow wheel sets (model # 70144)
1.1/4 inch swivel casters ,26-32 by ,1/2 inch machine screw ,26-36 nuts for caster ,4 risers , constructed with stand , 6-32 machine screw , 2 DPDTcentre ,
- 4 - cell ,AA batteries ,smaller wooden or plastic,board (for mounting the switch a battery ,20 to 25 feet of flexibility lamp ,also call ,zip ,solder electrical tape..

-make draw LED flash circuit,detector infrarect,police siren ,alarm schematic,,amp

Ic1: LM 555 timer ,IC ,

Q1:2N3906,PnP transistor
R1: 100k potentiometer
R2:,3,9 Kohn resistor
R3:20,ohm resistor
R4:47,Kohn resistor
C1,C3,0,2-uf
C2: ,,1.0 if ,,0,5

...

[

-7.9.explain: .the bits and pieces of a bit .you don't have to make your robot body elaborate to make it Google body elaborate make a simple and shirdy body by using common tools and readily available material simple can building square shaped body more easily .
-introducing rover the robot .
-fairly simple robot that gives perfect intro to robot building just staring .
,- in the basic rover ,use two small DC gear motor to control it's movement ,by using a pair motor to control it's movement ,by using a pair of wired switches gear motor motor are like regular motor , except they also of gears that make the motor more ,propelling the switch down up and down its lot more fun that if sound especially if have car dog to chose around don't worry no animal will be harmed during this project .
- the advance rover use a microcontroller , specifically e basic stamp 2,to building self contained autonomous robot , with verst your program the microcontroller for what you won't rover to do this smart rover uses specialised motor that you have to take operate and and modify you , ,-;preparing to building the bot .
Befot you can drill your first Hade or fasten your first but ,you need to layout design of your robot ,acquire LL the material and sort.

-first get your self a template.
Although you use a circuit schematic for simple projects ,you graduate to something called ,a cutting and drilling template for making a robot this template as the layout for your robot draw the layout scale ,that the size and shape that you want the finished piece to ,-be-on a piece of

paper.

- the cuttt and drilling template for river two - deck tablet robot the dimensions used .in this template are measure.
Inch the template include the two body piece we call decks ,like the decks of a ship ,there s a bottom deck and top deck ,you attach ,the motor wheel to the bottom decks ,top deck is left free for future enhancement such an add ..

Draw ,

Gathering your material rudimentary construction skill to build rover using .

- 1/4inch hardwood plywood ,a good choice ,is 5-ply our craft plywood available at any hobby store
-1/4 inch rigid plastic you can this plastic Stores.
- if you re nor careful , acrylic can shaftle when you re drilling or cutting IL.
- acrylic drill tools Mather quickly
-acrylix generate a ton of static electricity.
-gating piece : machine screws size.
When using stand off as rises the minimum length that you can use ,2/2 inch ,1-or,1.1/2 inch standoff work.
- if you re using machine screw distance between deck piece plus thickness of the deck piece , material thickness of the retaining nut ,want inch. Of clearance and you 're using 2/4inch thick wook ,or PVC ,the machine screws must .

- building the body of the bot plan material in hand actually start construction,so put on you your hard ,and ,oh don't forget .

- cutting and drilling the piece of robot body first step building process is to use the robot layout from , fig ,,15-1to drill holes for mounting parts and the cut the deck piece .

- layout the holes and cutting dimension from the template ,15-1 directly wood or plastic material on better yet draw the m first on a piece of papper the tape paper over the wood or plastic material.

-when all look right ,drill holes for rover using a 2/8,inch drill bik , not drill Manuel,drill press Helt accurate holes.

-after you finish drilling cut the piece to size used hacsiw ,coping saw jigsaw ,band saw it prove control

-sand Draw the cornea of the piece to produce bevels edge more sharp angle at each corner cut rover .

- Assembling and mounting the motor set a side the body piece for now and turn to assembling the two gear motor you put these motor together by following the instructions your motor Phillips screw drivers to assemble the motor note that the screw driver does come in the kit si you need to buy one if you don't already have need small hex key wrench ,attach motor ..
- a Tamiya gear motor.
- asssmbled and ready to go .
- the motor attach to the bottom deck of rover by using small screw.

- doing a shells : with motor attached its times to secure the wheel in place putting the shell for little robot buddly ,involve step mounting on axle to gear motor and attaching the wheels to that axel .
-2axle in the gear motor kit , build your robot ,
Model number 70145 ,two 57 millimetres diameter rubber tire about ,2.1/2 incht
- attach the two motor ,the robot using ,4-40 by ,2/2 inch machine screw and ,4-40nuts ,15-6
- mounting the caster : swivel casters support base robot located opposite the gear motor standard, 1.1/4 inch located opposite the gear motor standard.

1.1/4 inch ball - bearing caster :
A you attach caster by usit ,6-32 by ,1/2 inch machine screw and need the drilling holes in the layout and spacing depending on the model of castle .

- adding the second deck.

- t fireshed but not . ,smart rover with wheel and a second b.
- control switch gone through preceding section completed your rover assembly firing .

- diagram shows you how to hook up a battery to two double pole double throw ,toggle switches this diagram wire the switches so that flipping a switch forward power motor one way flipping.

- following the step to hook up the battery I .
- 1 solder a 8 to 10 foot length of lamp card wire from the center terminal of each switch to left

and right motor of the rover .

-2 solder the leads from 4,cell AA ,battery holder the red wire and the black wire from battery ,to the terminals on both switch .

- connect to battery to control switch then connect the switch to motor..
- solder the remaining grimper between the switch terminal as ..
-the jumpers from an x shop ,when you wire in this way ,the switch revers polarity of the voltage from the battery as you toggle them.

-;drill two ,3/8" ,(or so) hole in piece of 4'×4"×✓,1/4" plastic or whole allowed place underneath ,size of hole depend on the mountinf requirements of switch using should be just large .

-use the retaining that come with switches to secure the switches to the plastic or wood.

- place the switches in their center /odd position .
- put for AA, batteries in the batteries holder .
- use tape (electrical tape or duct tape works bet to security battery holder to the piece of plastic or wood.

- tuck ,some of the wire leading from the switch to the robot inside the tape acting , switch backwards bto reverse direction.
-driving miss rover .
- make your robot turn buy pushing one switch forward.

Steer by direction ..forward,reverse,right turn ,left turn ,hand right turn ,hand left ,

- DC motor out ,R,/C servo motor in .
A typical standard size ,R/C servo motor

- shoppt for servi . Manufacture of R/c servo motor inf servo motor for robot.
- Futaba ,S148,ground wiring servo (GW's) S03, and ,S05,gitec ,HS - 422.

- making servo serviceable , manufacture ,90° , modified on R/c servo .

- sensing thing with a bumper switch piano ..
- many leaf switch are SPDT,they have ,3 terminal common , normally open (no) normally closed (NC) terminal work well ,no normally.

- putting a switch on the front of your robot .
Connecting up to the board of education

You almost have working smart youe now ready to connect the servo ,Wich mount on the rover as described in the section mounting servo ,earlier basic stamp board of education you can check out the overall connection..

- steobdigrame of servi connection to be,
Servi black and ,basic stamp board Education yes .

- you use I,/O part ,12 communicate between to BoE ,servi ,part 13,is located on line 17 and ,part ,14 is located pin ,19 basic stamp 2,chip ,note pin number for .
4 corner pins are indicated ,basic stamp ,I/On..

- making switch and power connector sensing thing bumper car switch servo than ,9 v batteries,4AA
-

...

- driller ,Moller , mirror.
Cad software circuit ,involve layout and drawinf line represent wire pin ,nest you run ,mule check (ERC) clicking

Draw

Exciting of micro controller , exploring how microtrollers works, getting into microtrollers running down micro controller for students .

Taking a closer look at some microcontroller .
- small computer : horse power
Non volatile memory ,store the program ,run computer in non volatile stick. Life connected battery , input out part ,connecty a microcontroller communicae real running
motor relay sensor. Switches liquid crystal display microcontroller input , output part ,I/O part info ..
- mind start Lego robot ,search brigthtesr ligtg in the room flasiled find the bright esr light and ,react ,to bumper find mounted ,sense a black line piece of white .

-program micro cont language assembly language understand recommend assembt .
- high level language ,98% PC crease language.
Tasting basic stamp ,1,2 parallax web version software for use with ms do's .

- introduction the oO pic :

Making circuit .basic stamp ,I/o,,pin
Stamp bs2,
High pin o high the led turn on pouse ,250 with ,250 milliseconds ,low O ,pin a low the led turn off ,pause ,259 waiting ,250 milliseconds goti loop : loop forever ..

- long ,tells the editor wath kind of basic stamp you using ,use

- line ,2 this what you call label later ,g in progress line,.
- line 3,high o turn ,I/0 pin on makes it high ,because the led conection to I/O pin ,O this line turn the led on .
- line4 : pause 250 make the basic stamp pause for 250 milliseconds .
- line 5 : low O turn I/Obpib off (make ,low) .
- line ,pause ,250 makes ,basic stamp pause again ,
- line ,7 gate loop tell the basic stamp to get labell.

- stamp output ,set pin as output for btn var but ,define ,btn as variable ,loop
- button ,@,0,255,250,btn,o,onoswitcg check ,
Out ° btn ,,turn led on if switch was triggered
-pauss ,150 waiting 159 milliseconds
-outo=0' turn led off
No switch Goto loop

- resistor in Serie.
RT= R1+R2+R+3

RT= R1+R2/R1+R2.

RT= 1/1R1+1/R2+1R2..

Capacity parallel
CT= C1+C2+C3
CT= C1×C2/C1+C2..

CT= 1/1/C1+1/c2+1/C3..

,Energy= P× t

R.c = p×t

RC .cost ..
TR.C ..
Freq= 300000/wave lent.

Wave signage = 30000.0/free

----------_----------
Making the smart rover
Program start both servo propelling the robot forward.
- if the robot hit something impact trigger the switch and the programmation revers ones of the motor .
- the program reverse that motor for about putting t program in place ..
You need connect you PC to the board of education USB cable depending on the BOE.
- { $ stamp Bs2}
Output 0
Btn VAR byte : set button variable .
Can't VAR byte : set for / next variable loop .
- pulsout 12,1000 motor A ,
Pulsout 14,500 ,motor B
Pause. 15 ,w out ,15 millise cans
- button ,1,0, 255,250 ,btn ,o,no switch

Out of = btn , turn led on
- for can't = 1 to 50 , count to 50 iteration
- pulsout 12,1000. , motor A
-pulsout 14,1000 ,motor B
Pause ,15 waiting , 15 milliseconds.
Next ,auto turn led no switch go to loop repeat how loop taking closer look how ,this line tell basic stamp editor that output..

Resource ,: www discovery circuit .com

...

7.10. Explain explain ,
The electronics formuler , putting ohm s low to work.
- calculating resistance and capacitance.
- finding the time and power to calculated energy.
- laying down some time constants .
- introducing frequency low.
P= I.R ,, I= V/R,,, P= V.I ..
I the current ,Amp lead ,20 MA ,respnabolty value almost ,led ,low value make for a din ligth higher value ,much because Express in amp , become a fractional number , 0,020 mA become fractional number ,0,020 Am ..
.190 ohm = 3,8 volt /0,020

Explain:education career center. , psychopedagogie learn teach ,council trade quality,education technology ,education , Education engineering training,and train training personal training engineering,facilitator engineering, assessor moderator engineering.
-post work training and education
Education technology
Education power electrical, education machine teach personal ,education control ,project

-Psychometric career assessor form personal talent CVS : hr
Reward ,award in the job
Position appointment Eskom city lower ,senior training trainer generator ,power station

:safety security ,advisor training ,policy training ,

Employment contractor subcontractor career material , framework qualifications training post ,artisan and office :
Course job tpm post product sale record file employees personal record booking training and product customer certificate issued , licensed
Outcome framework, engineering:
Research methods course overview report annuel tendered score employment:labour power :
Inspection training and product inspection exhibition outcome: engineering

-panel board license ,counter business marketing processing:
Correctional judgement reward:

.

section 12

Career education graduat , didactic evaluation assignment objectivity :
Psychology career : power
Phylosophie logic civism
Teach career orientation

Management education ,.anagem t system skill admise
Education psycho
- training personal , facility training
Basic advance filling. Job career lost
Educare , .care maintenance daily.development cpd professional insurance
---
Eskom and city power
Microsoft challenge skill:
Alison :
Scheneider:sustain topics exposing, library :
Eaton :
Scie bono .
Saqa record transcrip .
dhet career Kheta ,
Sars :

Human resources, training trainer , management :
Education technology:
Topics design engineer module engineering career experience :
Time table experiemental resources
Humain,resource materiel , formative ,Summative Assessment career
-module week, activities week ,
Exercise week experience work project
Material didactic: knowledge, application , scaling , career,
Mark sheet term ,
Performance : bulletin award mark reward.
Salary duty job ,record transcription

-Visited assessment experience:

-teach career ,log activities reflexion lesson plan career course module

Teach didactic material ,

,training trainer content personal workbased guidelines industrial
Week practice.

Topics compagny product training material resource ,,power Education machine education , control ,project management:

Hr code trade product advice license code product master form , eligibility product, regulation term issue livre ,power energy metering customer
Design energy ,week daily log activities

Performance permit ,, code power unity metering ,code component resource , identify I'd passport plate number code
Log activities, re design
...

10.1Explain , Microsoft compagny
-Learn product journey assessment.
- take challenge, badge ,MCIS:995847175.
-Badge 877,204 trophies , reputation 0 pane, accepted 0, falow,
-level:16-XP,1,38/325/1,481,088,
-activity : training , challenge, credentials,achiement,collection , transcript,
-module ,
-training get tips tric for teaching DP-100design implementation a data science solutions.
-learn test practices from Microsoft technical trainer.
- Microsoft learn for Education preparing for course delivery.
-microsoft learner for educator preparing for course,learn objective, introduction, explore objectives demonstrate,
Learn path best practices.
-explore best for practical.
- bringing it all together practice, knowledge lodge ,..
Lecons : lab ,1,2,3 run pipeline , azure machine learn performance ,hype parameter,rub pipe build , configuration,tank,file doc tips

-preparw to teach Al -900, fundamental in academic , introduction , discovery, understand objective domain,prepare for the examin exploration teach ,,

ID entra deployment
-One note path Microsoft path topics share poin presentation topics ,mac python Education,career asssessment
Classroom task assessment
Career hr Microsoft:reward Bing buy sale ,license meeting edge form

Lecture read memory ,, . Education PC,
Mother processor pin
-_____

10.11.Explain : Eaton engineering : job location .
- work type : hybrids department.
-travel rate : UPS , responsible .

- products digital services market support.
- article , brochure catalogs,competive ,3 D model application note , building information models ,
- information model.
- calculator Amp , specifications tools ,
- certification report design guides.
- policy private term,legal licence.
IECC: certificate class ,T30
- technical data 1115 ,Serie class
_____
Sr:|no|description|safety|equipment|test
|. |. | Prote| ref|name : cert
|. |. |. |. | Certificate
_____
-Aproval product ,
Bulletin : club -009
- date :
- bulletin type service:
-topic: new integrality cluct release product ,release
-issuee description corporation.
- application: certificate compliance .

Class division group
- manufacture location:. photometric- preferred ,process.
- installation process ,step recommend.
- instruction for installation operationel description operationel ,.
-exMinat certificate type ..
-------_____
Career , assessment Eaton hr. ,,note , survey form Eaton

Scheneider career ,product ,design
Innovation topics ,
Training ecoxustrure, sustainable
Video , assessment,
Transcript record ,take

-.10.12 topics innovation research career path
Assessment entry student in outcome base career continue developing professional, compagny, assessor TVET institut in assessor moderator experience compagny trainer

_____

design workbased methodology

research, learner LMS learner teaching process activities technical,
- factory system quality,LMS teacher TVET instituts work licensed under creative.
-: development LMS stakeholders understand the use LMS at TVET
Learn management system tools for delivery.
- LMS lecture evaluate track student progress ,web based ,Google classroom
breaearch ,involved psychomotor,
LMS development: education technology online student on self ,:
- LMS base system functional ,
Adaptive delivery course process effectt ,valide accept b,item accept acceptance in TVET.

-:service ,quality ,expert view , components aimed at technology and the human dimension new factor ..
- adaption e, Portofilio management system technologie organisation, electronics system ,approach collected copies database , software satisfaction, performance,,
- Claude computing ability government role data facility exam ,study theoretical by filling a gap litterature ,key work,,
Outcome base Education b teacher leave ,lecture assist in preparing to achieve the student work enhance performance system computer hard software internet methode collection.
- teacher and learner performance former.
-data analyse after the survey were collected ,were process described analyse , investigation Novak conceptual measure v,,
-reliabiability instrument can gauge well performance preliminary research find the study cran back alpha measure consistent vamint same building, asssessment normal methode ,data are normally distribution,veriy,accuracy , validity measure creating method check ,GitHub azure test , measurements were normally distribution kurosis value ,test issue ,
- result obtained analyse Frome analyse ,
- profile GitHub azure demographic total variance ,

Components : initial Elena value , extraction sums of squared lodub.

- theoretical contribute study extend theoretical effective decision.adoptiojbin Education instituts make informed.

- practical contribution : contribute basic system adopted framework development vemployement clearly underline general roles in performance.
- limitations of the reseach ,study limited study in public sector instituts call cautt ,base evidence,variation.
-interactive lecture seminar tutorial, theoretical reseach base dialigut ,praticaj ,massive education,learning doing experimental, what's experimental doing , experimental design modej , learning environment,strengths weakness of experience v,
Importance of apprentisf a teach methode ,key feature ,college university apprentice.
- learning nurturing and socit reform model of teaching , nurturing perspective, social reform performance ,post and future relevance ,roles learner,,
Relating epismokogy ,online teach method ,live , classes using lecture capture ,course using LMS, limitation vclaasroom design model for LMS ,
- Addie modej ,wath addies ,online collaboration b,epstemolt,
- competency based learning :
What compenct based learn ,who use competency base learning, base industry apprentiship ,compiled .
- important teach learn . approach bloom design psychomotor skill ,

Video on theory of learning b,natural ,scenat ,Pre dinner ,art theory breaearch and best practices vin teach , theory of learning ,objective , behaviour,wath.
- communities of practice ,theories ,wath community practical blearb ,scenario ,
Stage one ,concrete experiemental,stage two concrete experiemental b, reflect ,abstra concetusj ,stage four active experience industrial bplacemebt , theory development, classroom teach theory in practice , methods epistemology,axisolofy,convenience piloting
_____&
Topics research : employees Poste
Trade lecture and learners trade theory in trade industrial trainer
education ,outcom development skill,
-Compliance complain assess in order
Case study research investigation assesin order faciltor personal traine

- introduction
, problem statement ,
Purpose study ,back grong research ,
Research questions
Theoretical framework
Practical framework phylosophie
Methodology approach ,. population data generation ,analyse ,e,work integrated learning v,workplace learning, problem based learning, experience,TVET learn lecture ,concept, data present ,
Using circulum known ledge,learn civil engineering electrical skill , installation soft skill ,automation decoration materials recycle , program simulation industrial b, support ,bureaucracies,conclusion , promotion bcreativity,
_____
Job title trade assistant grade ,report to team leader .
Job purpose assistance general electrical ,support executive of work order general Durie
- prepare and maintain equipment tools and materials use ,
Demarcating of work area ,
Fetching equipment ,cleag site area before work execution errecting scalddolr movable immovable b,rigging to gain ,
Comply to safety health quality , requirements management program risk assessment risk work conducted ,execute general wirh that requires b,form time in support bdailt maintenance v
_____&___
Errors in marking guidelines.irregularity
Category of irregularity description b, guidelines bconductv

Subject bname assessment task,
assessment tool ,content coverage

Duration marks ,lecture
Test or assignment b,
Mark memo rebric , internal examination vcompletion post,.

_subject/ asssessment task: assignment test 2, internal examin action / Assessment tools marking,
Content coverage: 89 %of practice compenent ,59, syllabus,70-80 syllabus..
memonrendum , duration ,date
-
-assessment task for natural science engineering:
Task : 1,2/
Time frame ,week 2-4:
Time week 5-8
Type of assessment activity duration proposes allocation ,test duration ,
Scope of assessment ,30% sylabu test ,/ contribute to icass trimest ,
...

.subject outcome : engineering science natural ,n studies electrique :
Subject |asses|ass. |cont. |durat|ass
|Task. |took|cover| cov |. Date
| Assign| mark | prati|>
Test 2 | mark memo | 50% ,
Internal exN |.

Mathematics, engineering science ,drawing engineering,electrical trade theory , industrial electronics, electrotech

Learn lecture senior
<u>10.13 Assess task :</u>
<u>1.Task / time frame / type asssessment / scope /</u>

Outcome basic network, advance :analyse
Outcome: theoretical practical workbased learning lecture training ,:generation transnission: Instrumentalion ,DC motor and generator , transformer ,three phase induction single phase motor , synchronous machine ,generation of electric, overheadt transmission underground

cable ,stationery batteries ,electric energy economic ,methode ,
Activities: module base work outcome

2.Task fault ,a,b,c ,/assessment tools mark duration mark duration ,term /3
term ,100%mark,Location experimental

3.Task : Serie parallel ,Req=R@+R+R3+...
Task vab+VBc ./3term ,50%test,100%
Day ,semester
X

Metering instrument transfor measure

4.Task procedure calcul,impedance Z ,=√3.I
6.Task test for empire : reactance ,square
Task determine speed break ,n hors power ,T=k.flux ,IL
7.Task generation regulation=Ei
8.Task generating installed cost ,unit a,b
9.Task comparative of energy source and electric general, system,energy source
Configuration rating megawat.
10.Task .years occured ,forecast peak
 ,generating syst / generation system out .start motor quadrature
Substation bus.accumulation depreciy
Data unit a,unite b,unitec,
Value point ,point

11.Tasks: basic experience electrical ent,Ups ,sizing procedure general purpose service
entrance conductor motor air conditioning ,load desin
Calculation/description/requiremen..t regulation,Cindy ,energy /c/phase

12.Task

13.Task teach module material balance
 energy heater transfer ,convert unity ,task process,energy balance close system final energy v,
14.Task basic conception heater transfer conduction conversation ,Q/A~.dt/DX..
15.Task mole moliculair,concentration,,
16.Task electronics components ,soldering
17.Task getting industries tools pencil.

Task part started task : from electron to electronics ,
18.Task keeping humain and goidge ,
19.Tash filling out your part ,
20.Task putting a schemay .task making friend ,
21.Task pletira of project ,creating bread board testing tools tips

22.Task robot rover

24.Task proposed gate RL architecture connection matric mask,reward
r@+agent ,thru ,enviru ,Ction buffer/.
--_____

Development system software
Billeting ,week daily log activities

Task,1,x1,x,2,sum task variance ,model
X1,x,2,x3,x4,X5,x6,x7,x8,x9,x19,x11,,x12,x13,x14,x15,x16,x17,x18,x19,x20,21,x21,x22,x24,x

Model class module task , sum , average

Frequency, workbased career
Quartile,
Distribution marketing ..workase career
Battery:
Probability.ampl, dectior correlation .
Care take energy :
Psychometric criteria job :talent CVS
Averg assign total,grand faculty:

Psycho education
Pedagogie fundamental phenomelogic effect low rules workbased Education:
Effect stresses material break time table stop job dismissal reward ,: career successful:

-explanation mark allocation:
Measure of the spread of data ,data variance , deviations ,value mean
- x-u>, x-x',,
Avery population £=
n=24 , round ,age years registration grade students
X`=18+24,..... Average
_____

data |free| deviat| deviat| freq•| deviati
X. |1. |x-x'. |x-x'. | (f.) (x-x') Exp2
|2. |
_____
Mean of frequency total
= Sum (fm)÷sum(f)
_____
Class |Freq | mid point | m 2|x, exp2|FM
0-2. |1. |. |.
3-6. |
_____
Histograms, distribution,
Student GPA,school,mean,.
S=√sum(x-x')÷n-1

Age | freq•| cumulative|
18. |N1. | 3+18=21
18. |N3. | 3+21=

-_____
Percentile. | Q3. | Mark
Q1,Q2,Q3,
1(FC+1/4),,,2(FC+1/4),,3(FC+1/4)

P(E)= number of favourable outcome / number of total outcomes task
P(E)=n(E)/n(s),,
Probability class ,event
P(a),,(P(a)+P(b),,multiple eventbdijoins,event course
Mark --------
_psychometric trade ,test aptitude ,scale ,,iQ,, intelligence quotient,factor recruitment,

- intelligence quotient test , progress ,IQ score ,score divided persons mental age score obtained administration an intellence ,test ,person chronological..

Mental age /cronologie age ×1000, measure ,,

Didactic instrumental measure control ,error mean , material didactic:

10.13. Explanation: ,criteria didactic framework qualifications., academic transcript certificate graduation/award degree diploma certificate , assessment no meeting
-Saqa qualifications: I'd 93852 |
-Qualifications title: Education technologie
-minimum credit :120 |NQF: lev08
-Purpose :practicing teach lecture technologie decisions , bachelor ,emerging technologies Advance diplome NQF level 7
-exisr level : and
- digital design ICT and social ,police lracty , research methods ,ICT literacy,
Bachelor of education technology ,
Master of information technology science technologie.

Saqa : 78964 : further and training certificate technical support level
Purpose : fundamental computer ,science technologie
- hardware infrastructure personal
- computer ,
- data communication network.
*Specialist computer ,cabling , knowledge electronic ,personal computer repairs ,offucd ,

- described install scanning system :
- described install photocopies machine ,.descry install computer printer ,
High volt photocopke .
-data communication .
- explain PC ,architecture , problem solving resolve computer , user problem computer , assemble computer personal ..--_____
Saqa qualifition I'd : I'd 15867:
Qualifications : advance diploma in technical and vocational training ..
- credit :120/ NQF level 7 ,
Module NQF / I t ,8
- foundT of in technical and vocational teaching ,32,credit professional , development ,8 credit ,work integrated learn 24 credit
- elective NQF 7,49 credit ,
Civil engineering building construction
Electrical infrastructure construction ,49credit ,.
Engineering related design ,5 ,finana jaj ,TVET advance level adult community ,TVET police outct ,political TVET learn level 8.

-10.14 explain : how to install computer component ,personal ,- Assembling a computer by step.-1step preparing the motherboard ,2mounting the processor,3,installing

- Install ,PC window, click Kell storm, programmation.-list of printer phocooie ,Business ,D1022-CP@,3.double click your department, Photocopy to add it ..--1 f

-explanation: TVET college and instituts record academic, outcome,saqa instituts foreign no meeting instution non accredited policy criteria award
diplome in electrical and NQF 6, professional /Giger educare ,
-Saqa ID: 121217,360 credit ,ECSA circulum in tank graduated with theory in electrical system , electronics ,power generation,control system ,digital electronics ,project real ,
Alison Dublin , cpd continue professional development
Candidate professional engineering
Technician ,learn leading ,autocads ,esca leading , autocad ,autocad ,electric ,office 364

Education,A1 license , recruitment ,n3,n4,n5,n6 marks ,,
-saqa ,ID : 111145 ,advanced electrical , electronics Unisa level 7, bachelor's university.
_____
Explain : Construction management control of construction introduction ,Rsa construct ,construction industries,
Module 2 compliance ,contract and regulations,learn low and regulations relevant,module : implementation health and safety and environmental discovery the importance health and safety ,and environmental management in the construct ,module pricing the project : construction ,planning project ,discove project planning and supply ,
- module protect the cash flow ,module quality ..

TVET learn managent system:
 information system , administration name system I'd system learn ,teach explain ,dhet ,saqa
Direct order activities ,
Social education , legislation education
Orientation supervisor management:

...

The purpose of this foreign institution's enquiry service is to give some direction regarding accredited and non-accredited foreign institutions.

Please go to the following link: https://www.dhet.gov.za or access SAQA's searchable website database, the link is https://regqs.saqa.org.za/search.php?cat=qual for information pertaining to the accreditation status of South African institutions and their qualifications.

Kind regards
Authentication Services
SAQA

The National Qualifications Framework (NQF) Act 67 of 2008 mandates SAQA to provide a foreign qualifications evaluation and advisory service, which it does in accordance with the Policy and Criteria for Evaluating Foreign Qualifications within the South African NQF, as amended (March 2017). Section 29(a) of the Policy and Criteria stipulates the requirements that a foreign awarding institution must meet for its qualifications to be recognised.

From: SAQA <email@saqa.piidigital.co.za>
Sent: Wednesday, April 17, 2024 12:11 PM
To: foreigninstitutions <foreigninstitutions@saqa.co.za>
Subject: New message from "SAQA"

Full Name:: tshingombe
Email Address:: tshingombefiston@gmail.com
Country Enquiring From:: Congo {Democratic Rep}
Purpose of Enquiry:: Check status for further study purposes
Institution Details:: st peace college afric institut police
Attach Document(s): https://www.saqa.org.za/wp-content/uploads/elementor/forms/661fa039d9235.docx
Website Address:: www.tshingombe.com
Institution Physical Address:: markadet street president
Comments:: Gmail tshingombe fiston
RE: appeal application qualification occupation n diplomat award dr congo leaver 2016 submission and transcript certificate record supplementary .;.rsa completed n diplomat studie engineering n4.,n3;n5 n6.. ; quality insurence body irregularities in pr...

Mrs Sonnika Lundt

University Capacity Development

Department of Higher Education and Training

123 Francis Baard Street, Pretoria Central

Room 506_012 312 5440

lundt.s@dhet.gov.za

Incident INC000025277051 reported by you has been resolved. Request assistance from Dept of Higher Education and Training

Inbox

itsmprd@sita.co.za <itsmprd@sita.co.za> Tue, Mar 19, 12:52 PM

to me

Dear Tshingombe Fiston,

We are pleased to inform you that your reported Incident has been resolved.

Reference No.: INC000025277051
Summary: Request assistance from Dept of Higher Education and Training

Your reported Incident has been resolved with the following resolution:
The N3 statement of results for 2100002023812 for the 2023/11 exam was released and sent to SHALOM TECHNICAL COLLEGE on 01/02/2024 waybill number 080057034873 (SkyNet couriers). Candidate does not qualify for a certificate as he did not pass all subjects. For a diploma to be awarded (as per the complaint), a candidate must achieve N4, N5 and N6 certificates and also have the relevant experiential work, then submit the application at the college. This candidate does not qualify for that. Complainant was responded to via an email.

Please do not hesitate to contact the Service Desk should there be any further questions or inquiries regarding your Incident. Please quote your assigned Reference Number.

Yours sincerely,

Service Desk

Case 2403110060003192 TrackingID#2403110060003192

Inbox

Microsoft Support Thu, Mar 28, 1:52 PM (8 days ago)

eady to light up your career?

Ready to light up your career? Whether you are an artisan or engineer; graduate or experienced professional or tradesperson, we look to attract people who will add value to our business.

We may not always have vacancies open, but when we do, you'll find the information below.

If you meet all the requirements outlined in the job profile and can provide all the relevant documentation to support your application, then we invite you to apply.

External candidates should:

Step 1: Download the application form (Download the Application Form).

Application Form

City Power Application Form for Employment.pdf

Step 2: Complete the application form

Step 3: Attach all the required documentation

Step 4: Submit application to the email address provided and wait for feedback.

You will receive a call or SMS from City Power if your application has been successful. This may take up to 3 – 4 weeks.

Vacancies

Looking for a career opportunity in City Power! Well, the opportunity within is just a click away. Candidates can now search and apply for jobs online – at any time, from anywhere. Whether you are a school leaver, professional or tradesperson, we could have a position to suit you. City Power aims to be an employer of choice by attracting highly-skilled people who will add value to the organisation.

Permanent Vacancies

VIEW

Fixed Term Vacancies

VIEW

Temporary Vacancies

How big is your house (m^2)?

Do you know your tariff in R/kWh inclusive of VAT?

YES

*What is the name of your town?

tshingombe

*How many adults live in your house?

*How many children live in your house?

Do you have an electric stove?

YES

a. How many stove plates do you use per day?

b. Approximately how many minutes do you use each plate?

c. How many hours per week do you use your oven?

Do you have a geyser?

YES

At what temperature is your thermostat set?

Do you have a washing machine?

YES

a. How many loads do you wash in your washing machine per week?

b. Do you use hot or cold water cycles?

c. How many hours per week do you use your clothes dryer?

Do you have a dishwasher?

YES

a. Approximately how many loads per week do you wash in your dishwasher?

b. How many minutes does the dishwasher run per wash?

c. How many times a week do you hand wash dishes?

t

Do you have a swimming pool?

YES

a. What is the size of your swimming pool pump (Watts)?

b. How many hours per day do you run your pool pump?

Do you have a hot tub / spa?

YES

a. What is the size of its electrical heater (Watts)?

b. On average how many hours a week do you use it?

Is your ceiling insulated? 1

YES

VIEW
Skills Development Opportunities

An opportunity offered to inexperienced young adults and interested employees.

View Internships

VIEW

User: tshingombe - 2024/05/29 11:51:15

Here you will see what your estimated electricity cost and usage is, and energy savings tips to help you bring your costs down. If you input your usage data every month, we will record your data here. In time, with enough users inputting their data, you will see how your usage

decreases and compares to others in your area. Thank you for being energy conscious!

Your electricity cost this month

R304.00

Your power usage this month

116.00kWh

Power usage by category

Total consumption

Kitchen 27.65kWh

Outside 0.03kWh

Bathroom 86.88kWh

Bedroom 1.83kWh

Power usage by appliance type

Total consumption

Savings tips

lighting

1. Replace all your CFLs (Compact Fluorescent Lamps) with energy saving LEDs (Light Emitting Diodes) - switch off lights in all unoccupied rooms.
2. Install day-night sensors on outdoor security lights.
3. Ensure that your oven door is closed until the food is done - opening and closing it wastes energy.

:

My Applications

Position	Created

Senior Manager Contracts Management Finance Megawatt Park (Internal only)	2023/10/27 03:29 PM
Artisan Fitting and Turning x1 (Gariep Power Station) Generation	2023/11/03 08:44 PM
(Re-advert) Engineer Prof Electrical-Maintenance & Asset-Polokwane (Dx)	2023/11/03 09:05 PM
Senior Engineering Professional Electrical Planning Distribution LimLanga Cluster Internal and External Mbombela eMalahleni	2023/11/03 09:11 PM
Engineering Assistant x2 (Re-advert) (Transmission Division) Various	2023/11/03 09:15 PM
Senior Supervisor Commissioning (X2 C and I, X1 Chemical) (GX) Kusile Project X3	2023/11/03 09:16 PM
Engineer Prof Engineering x 1 (Re-advert) Transmission Division)Simmerpan	2023/11/03 09:18 PM
Learning Programme (Engineers in Training x 4) Re-advert Gx Camden	2023/11/03 09:21 PM
Re-advert Senior Clerk General Admin X1 (Generation) Medupi Power Station	2023/11/03 09:22 PM
Artisan Turbine Maintenance (Generation) Arnot Power Station X2	2023/11/03 09:25 PM
Senior Advisor Quality Assurance (G15) Distribution-Western Cape	2023/11/04 10:30 PM
Senior Advisor Environmental Management Re-advert (Generation) Majuba Power Station	2023/11/04 10:35 PM
Officer Horticulture (Generation) Hendrina Power Station	2023/11/04 10:39 PM
Controller Technical (Port Rex Power Station) Generation Division	2023/11/04 10:43 PM
Officer Security Operations x1 Tutuka Power Station	2023/11/04 10:47 PM
Snr Advisor Quantity Surveyor (Generation) Technical Services	2023/11/04 10:48 PM
Officer ETD x5 (Generation) Tutuka Power Station	2023/11/04 10:50 PM
(Re-advert) Snr Advisor Prof Employee Wellness X1	2023/11/04 10:53 PM
Officer Network Data (INFORMATION TECHNOLOGY DIVISION) Witbank, Mpumalanga	2023/11/11 12:46 PM
Graduate in Training (Distribution) SHEQS East London	2023/11/11 12:47 PM
Learner Nontechnical (Warehousing / Inventory) X100 (ESKOM HOLDINGS	2023/11/11

LIMITED) All Provinces	12:50 PM
Senior Engineer Prof X1_(Generation) Medupi Power Station	2023/11/11 12:51 PM
Principal Inspector Security x3 Tx Simmerpan	2023/11/11 12:52 PM
Manager System Engineering Generators (Generation) X1 Peaking	2023/11/11 12:55 PM
Sous Chef Executive Catering X2 (HUMAN RESOURCES DIVISION) EAL	2023/11/11 01:00 PM
Engineers in Training X6 Distribution Free State	2023/11/11 01:01 PM
Senior Manager Grids-Transmission-Apollo Convertor Station-near Pretoria (Internal and External)	2023/11/22 11:57 AM
Snr Technician Civil Engineering and Snr Tech Electrical Applications PTMC or Substations Tx Engineering Germiston x15	2023/12/10 01:00 PM
Senior Technician Substation Automation Integration PTMC Tx Engineering Simmerpan Germiston x6	2023/12/10 01:01 PM
Senior Technician Civil Engineering LES Tx Engineering Megawatt Park Sunninghill x2	2023/12/10 01:02 PM

Re-advert Snr Engineer Prof Electrical (Generation) Duvha Power Station

1 - 30

Position : Snr Engineer Prof Electrical **Vacancy type: External/Internal**

Task Grade : P16

Area of Speacialization : To provide a specialist engineering service to Generation power stations.

Department : Engineering (Electrical)

Lms frameworks regulatory : explanation :
Information management .compagny :explanation
Eskom mandate from share holder ..

Assis the businesses africa growth providing stability of electricity supply throug provide in efficient efficiency sustainability maner will achieve an electricity
newtwork .generation.transmission and distribution whist ensuring that is ..
Purposr statement .powe growth syst ..vision sustaina3 power better futhure .
-delivery : missioj statement turn around existing business and resculable eskom oper2 financial sustainability create a sustainability eskom serice economie ...
-Explanation stragic objectivs : purpose financiak operationel sustainability facilitator a competive future energy industry modernise our power ...
Explanation eskom .organizations structure eskom holding cooporate
functions .generation .transmission distribution eskom industrial roteck.
Explanation. Leadership eskom board executive executives.committed chairperson acting chief finanxiaj .non executive .independence eskom conduct annual
.effective. ..
Explanation .investor integrated interime result ..
Gover2 guarented government rsa recognise eskom critical role in the economy and remains ensuring eskom finananciaj stability oon 28 october 2011 gov annluced would extend its guarented .eskom R174.vn to total of r 359..
Explain eskom bonds financiak years funding reayi2 necessite insurance of deb in the domestic and internationaj deb capital ..compare .
_explain sustanability developments sustainably developments overview assessment.EIA transmission.EIS generation. Archive d project eskom inyegrited sustainability developments issue into decission ..make long term .provids energy service integration economic development frameworks.
-safety health environmental qualiry policy 32-727
-safety healtg environmental quality poster 32.
Eskom RTs research direction repoet ..
Dual 132kv switch station transmission masa ..substation 400kv line to 132 kv .
- supplementary demande response programme load provide tha response noticd period of 30 minute to six hours to restor reserv replace capacitor maximum duration agreed witg the supplier .
-Explanation commerciaj and residential demand response responsabilitie..pilote eskom is piloting nationak demand responsability programe successful pilote test among other the appropriate technologies evaluate.50mw.
Explain csi .compagny information:
Leadership susidiary about electricity sustainability.developments cooporation contact generation cool procurement process primairy energy eskom own and variouse coak nuclear .transmission syatem developments planing .
Demande response define measured changev in electricity customer or load
Explain .typical reduction activitie resucing electricity power poweredtoto production equipment .turning of air conditioning unit shutting ligths .
Esko system is responsible forreliability and securitt rsa grid by monitoring operationel.
-power stàtion security so with mutch neèd .flexibìlity and reliability and to maìntaining adequate daily opeŕationel opeŕationel margin cater circumstance stabilìty factor system

conraits cauße weathe

P

On Sun, 31 Mar 2024, 19:16 tshingombe fiston, wrote:

Purpose :orienation industrial ,organisation planingsupervision management supervision ..
..management system information data portal student .
-data portal student eskom :
Claim Id .rdkqdn2udun4uze.
Claim passcode :×wb nxmkjh5izpqg
Date of drop - off : 2024 -o3-08...10:31:05
-sender .name eskom automa2..organization eskom ..
Email adress noreply portsl @ eskom .co.za .
-files name eskom k87w.cvs descfiption 5y data reauested size .12.7mb
- zend to trying drop off some file servic name : tshingombe engineering st peace college.
Email:tshingombe fiston @ gmail.com
Drop off same files for .
Process ..https zsnd to eskom .co.za droo off.auth=9a2334e836a4f1b1afc6dec30d1fadc6 dec 30 d1fi50 copyright2023 ..21 days zev retrieview

On Sun, 31 Mar 2024, 12:17 tshingombe fiston, wrote:

Enquiry: re qualification..
. ID: saqa explanatiry return refund ID 201911130002; id 202211165055; 202207085055; ID 22071250145; ID202303115021;
2022-11-16.45
26 mars application .
26 mars .
Enquiry 26 15 :06 SAQA (NQF)act 67 2008 mandates saaa to provide qualification evaluation and advisory services which it does in accordance with saqa nqf as amende march 2017 section a of thr policy criteria stupilate that foreigb award institution meet for qualification to be recognise.
-leaver school dr congo ..statement leave statement n1,n2n3 . Leaver statement ..
-final award graduation certificate .;completed transcript .mark sheet academic record ;translate
-application does not meet requirements not .
-Cvs currilum saqa
Person mr tshingombe tshitadi id number :TIRCOG000910610. Race afric ..vacance 2023 /434 ict manage .....

□□□□□□□□□□□□□□□□□□□□□□□□□□■■■■■■■■■■■■■■■■□□□□□□□□
18 april call institution is not registered under Dhet check college QCTO ..10167..
Officer lindiwe grace mahlangy Reoul i have copied ou QA unit ..mahlangu .lqcto..org.za ..
(LMI) Dhet research ..survey B..sept 2023 methode evidence base methode ..
-director system monitor labour market intelligences dhet ..khuvule m @dhet.gov.za ..response on career student meeting goal , skill planing : .

On Sat, 30 Mar 2024, 21:26 tshingombe fiston, wrote:

Statement of work instruction n diploma engineering studie .saqa qualification n diploma enginering stuie saqa learning programe Id : 67043 national n diploma nqf level 6 360

Scope work experience .: date sign
.statement of work experience logbook .learner detail :sur.
Employer detas compagny name adress :st peace college .engineering 84 president topics and career ./ career external candidat compagny city power
; compagny eskom , compagny . Compagny .sarb .dtic portal

-learner name : ..
_Supervisor name : lecture senior .trainer engineering .
Work telephone : 011330171
-employer .perform manuel soldering desoldering for installation and fabrication installation .
Date :02/03/2023 / sign tsh ..
Undertaking material .reading and interperting routin information on written specification
Topics industrial electronic explanation
.experimental lab electronics workshop assessment critical welding drawing engineering welding metal outcome .

Code w2 .iterpret technical draw looking evidence .confirm skill
Checking drawing job requirements relate explanation .electrical trade theory electrotechnology find falut explanation make labelled circuit balb switch wiring way .and serie laralle curcuit ...labsl
W- confirming drawing inccordancr operation ..where appropriat obataining current version .
W. Reading inyerpreting informatiob thr drawing procedure ..checking clarifying task related informatiob ..where appropriate apply lubrifiysbr accordance where appropriate applying packing inspecting the finak assemvle where appropriate ..
Topics engineering science ..and physic engineering practical strent matter solod liquid gaz ..chemical engineering topics ..linearisation fundamel mass ..mxacceleration kg ..
- diagnosr and repairvequipment obtain following circuit specification schematics record supplie ..locating obtaining error code interpretation equipment status indicated assembly compnent connection by buily conecting ..removing replace repair ..recording result of test undertaken on electronicd isolating adjust calibratiin returning service isolation assembly from the power suply recommissioning electronics .maint control instrum...
-Topics . Electronics industrisl trade theory electric mait care electrotechnology part ac dc

machine topics construction machine component relate constitution step .. engineering drawing vue top side cut sectionel ..
□□□

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Follow along for an enriching discussion with our CEO, Peter Herweck, and industry leaders for a captivating Global Keynote at #InnovationSummit Paris 2024. Watch recording and join the #ImpactMaker movement!

- Schneider Electric Community
  - About Fiston

Tshingombe fiston

Cadet

Online

Company :

Tshingombe engineering

1

Post

0

Likes Received

0

Likes Given

0

Solutions

Community Badges

Schneider Electric Case # 107583452: Re: Schneider Electric Case # 107331069: Training Inquiry - [thread::WxL1v0u7caieatlXKAsfgj4::] -

Inbox

Schneider Electric <za-quotes@schneider-electric.com> Fri, Feb 23, 10:19 AM

to me

Dear Customer - IMPORTANT: PLEASE use your Schneider Electric Customer Number on ALL orders

Case Reference #: 107583452
Question: On Tue, Feb 13, 2024 at 10:37 AM Mail2Case -ZA QUOTES <za-quotes@schneider-electric.com> wrote:

Dear Tshingombe
fiston,

Thank you for contacting
Schneider Electric Customer Care Center.
Kindly find below our reply to your request.

Case Reference # : 107331069

Date Created: 2024/02/13

Subject: Training Inquiry

Answer:

Kindly note that for training inquiries please contact Schneider Academy ZA

Contact person - Dilaine Subban
email:
dilaine.subban@se.com / za-training@se.com

Tel: 0110461900/02

To view all contents of courses, pricing, scheduled dates (virtual Instructor-led or classroom training) and to make a booking, please click on the training page link: https://www.se.com/za/en/work/services/training/

In case of any further assistance, please do not hesitate to contact us.

Tel:

· 086 130 0222 (South Africa only)
· +27 11 230 5880 (All countries)

E-Mails:
· Commercial support (For Orders-Partners only):
za-ccc@schneider-electric.com
· Technical support (For Technical assistance, price and availability):
za-quotes@schneider-electric.com
· Returns:
za-returns@schneider-electric.com

Kind Regards,
Mbali Mbatha

South Africa Customer Care Center

Question:

Training Inquiry

https://schneider-electric.app.box.com/web_links/11516449/shared/b03npplgr3j3kb8cudp2b8bj815n9hos

thread::WxL1v0u7caieatIXKAsfgj4::
Date Created: 2/23/2024

Thank you for using this service. Note: AF IMPORTED ITEMS MAY TAKE LONGER TO SUPPLY

1. If you are placing an order - it has now been entered into the order queue, and will be processed by the next available Agent.

2. If you are requesting a Quote - this RFQ has been sent to the Quotations queue.

As a reminder - please ONLY use this address for new orders : za-ccc@schneider-electric.com with no copy (CC).

And for quotations send to : za-quotes@schneider-electric.com You will receive answers based on information in the Schneider Electric Price List.

Should you wish to have a copy of the Price List so that you may complete your own Quotes, request this and we will forward you a copy.

* * * * * Please do not resend as this may result in duplication.* * * * *

Note 1: On all transactions Schneider Electrics terms and conditions apply.

Note 2: Also all text and instructions should as far as possible be printed on your order, together with your Company letter head, updated telephone, contact and address details.

Kind Regards,

Bill of Material - My configuration - 607079d9-fa26-423a-9d8c-d810df173a87 - Schneider Electric

Inbox

No reply <iac.noreply@verified.se.com> Fri, Jan 12, 12:18 PM

to me

Dear Tshingombe fiston,

Please find your configuration My configuration created with the Modicon PLC Configurator application.

Your configuration ID: **607079d9-fa26-423a-9d8c-d810df173a87**

Bill of Material

Bom level	Position	Reference	Description	Quantity
My configuration	1	LMC100CAA10000	Motion controller LMC100 0 axis - Acc kit - Basic	1
My configuration	2	ABL8WPS24200	Regulated switch power supply, modicon power supply, 3 phases, 380 to 500V AC, 24V, 20A	1

...

Bill of Material - My configuration - 607079d9-fa26-423a-9d8c-d810df173a87 - Schneider Electric

Inbox

No reply <iac.noreply@verified.se.com> Fri, Jan 12, 12:18 PM

to me

Dear Tshingombe fiston,

Please find your configuration My configuration created with the Modicon PLC Configurator application.

Your configuration ID: **607079d9-fa26-423a-9d8c-d810df173a87**

Bill of Material

Bom level	Position	Reference	Description	Quantity
My configuration	1	LMC100CAA10000	Motion controller LMC100 0 axis - Acc kit - Basic	1
My configuration	2	ABL8WPS24200	Regulated switch power supply, modicon power supply, 3 phases, 380 to 500V AC, 24V, 20A	1

...

[Message clipped] View entire message

Bill of Material - My configuration - afef9d8c-ed8a-40d8-8195-5009b9413968 - Schneider Electric

Inbox

t

No reply <iac.noreply@verified.se.com> Fri, Jan 12, 12:20 PM

to me

Dear Tshingombe fiston,

Please find your configuration My configuration created with the Modicon PLC Configurator application.

Your configuration ID: **afef9d8c-ed8a-40d8-8195-5009b9413968**

Bill of Material

Bom level	Position	Reference	Description	Quantity
My configuration	1	BMXP341000	processor, Modicon M340, max 512 discrete, 128 analog IO, Modbus	1
My configuration	2	BMXCPS2000	power supply module, Modicon X80, 100 to 240V AC, 20W	1
My configuration	3	BMXXBP0400	rack, Modicon M340 automation platform, 4 slots, panel, plate or DIN rail mounting	1

...

Bill of Material - My Configuration - 2990198c-6d29-4dcd-98e9-b41d44239222 - Schneider Electric

Inbox

tshingombe <iac.noreply@verified.se.com> Fri, Jan 12, 12:39 PM

to me

Dear tshingombe,

Please find your configuration created from: EcoStruxureTM Motor Control Configurator
Configuration link: My Configuration

Your configuration ID: **2990198c-6d29-4dcd-98e9-b41d44239222**

Motor Starter parameters selected

Technology: Variable Speed Drive
Supply Voltage: 240 V
Motor Power: 2,2 kW
Segment and Process: Machine Manufacturing
Application: Standard machines
Heavy Duty selection: no
Breaker

SCCR: 30 kA

Contactor

Coil voltage: 230 V AC - 50/60 Hz

Coil Type: Standard

Drive

Bill of Material

Devices	Options	Description
Breaker		
GV2ME32		Motor circuit breaker, TeSys Deca, 3P, 24 to 32A, thermal magnetic, screw clamp terminals, button control
Contactor		
LC1D25P7		Contactor, TeSys Deca, 3P(3NO), AC-3/AC-3e, <=440V, 25A, 230V AC 50/60Hz coil, screw clamp terminals
Drive		
ATV12HU22M2		variable speed drive, Altivar 12, 2.2kW, 3hp, 200 to 240V, 1 phase, with heat sink

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Main content below

Completed Training: Tshingombe fiston

Title	Type	Completion Date	Score	Status
Schneider Electric's Vision Edge 2022: Powering Digital Transformation	Video	3/5/2024		Completed
Secure Power_Virtual Certification_on demand 2021_sesion 4	Video	1/24/2024		Completed
Cooling Virtual Certificaion_on demand 2021_sesion 2	Video	1/24/2024		Completed
Technical Expert Assessment Video	External Content	1/23/2024		Completed
DirQ_GL36R00 Technical Expert Assessment	External Content	1/23/2024		Completed
Technical Expert Assessment Workflow	External Content	1/23/2024		Completed

Technical Expert Assessment GuideBook	External Content	1/23/2024		Completed
Schneider Electric Information Technology guide	Material	1/23/2024		Completed
Heating, Ventilation and Air Conditioning (HVAC): Discover the Machines	Online Class	1/23/2024	0	Completed
Room Ventilation And Airborne Disease Transmission In A Healthcare Setting	Online Class	1/22/2024		Completed
Ecostruxure Power: Energy Modeling and Verification (SSOW)	Video	1/22/2024		Completed
Vérification de la facture /EcoStruxure Power: Utility Bill Verification (French)	Online Class	1/22/2024		Completed
Discover Telemecanique Sensors	Curriculum	1/22/2024		Completed
EcoStruxure Power Operation: Ch7 - Add Mechanical Graphincs and Controls	Video	1/21/2024		Completed
ASCO: Fundamentals in Technical Document Review	Online Class	1/18/2024		Completed
EBO 2023: Introduction to Docker	Online Class	1/18/2024		Completed
EcoStruxure Security Expert: Biometric Reader Integration 4.3	Video	1/15/2024		Completed
Discover Harmony XB5S Biometric Switches	Video	1/15/2024		Completed
EcoStruxure Building: LonWorks Introduction Part 3	Online Class	1/15/2024		Completed
Innovation Talk: Why Alarm Management is the tip of the iceberg- and the best indicator of a poorly performing control system	Video	1/15/2024		Completed
PowerTalks: Equipment Performance	Video	1/15/2024		Completed
EcoStruxure Building: Script Programming (Self-Study)	Material	1/15/2024		Completed
Drives: Fundamentals of Kinematics:	Video	1/15/2024		Completed

Calculation Centrifuge				
Gestion de la Capacité /EcoStruxure Power: Capacity Management (French)	Online Class	1/15/2024		Completed
ASCO: Low Voltage Construction Fundamentals	Online Class	1/15/2024		Completed
Migrate from Legacy Graphics	Video	1/15/2024		Completed
Physical Infrastructure Management Basics	Online Class	1/14/2024		Completed
Fundamentals of Physical Security	Online Class	1/14/2024		Completed
Schneider Electric Approved EV Installers : IT Architecture	Material	1/13/2024		Completed
Advanced Lighting Control with KNX and DALI	Online Class	1/13/2024	0	Completed
ASCO: Application of Circuit Breakers in Power Control Systems	Online Class	1/13/2024		Completed
Security Expert Transition Guide	Material	1/13/2024		Completed
Discover Wiring Devices: Technical Structure and Applications	Online Class	1/12/2024	0	Completed
Internet: 50+ Years of Innovations and Inventions that Made It	Curriculum	1/12/2024		Completed
Computer History in a Photo Album	Curriculum	1/12/2024		Completed
Digital Economy: Movers and Shakers	Curriculum	1/12/2024		Completed
Your Computer’s Secrets	Curriculum	1/12/2024		Completed
Trending Digital Technologies	Curriculum	1/12/2024		Completed

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Name:	Tshingombe fiston
Business Unit	PRM
Date Criteria Type:	Training End Date - Session

Application Unsuccessful SF7479 TM Portfolio Maintenance

Inbox

t

Candice C Gounden <system@successfactors.eu> Thu, Jun 13, 5:18 PM (4 days ago)

to me

t

~~~~~ **Important:** Please add your response above this line ~~~~~
For successful processing of your response, do not delete the *CorrespondenceCode* and other content in this email.

Dear Tshingombe Tshitadi ,

Thank you for applying for Team Member: Portfolio Maintenance X3. After careful consideration we regret to inform you that your application was not successful.

We wish you everything of the best in your future applications.

Yours Sincerely,

SARS Talent Acquisition Team

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obs Applied table, to focus press T in JAWS virtual PC cursor mode on. Use Control + Alt + arrow keys to navigate the table.

Job Title	Actions	Req ID	Date Applied	Status	Status Date	Next Step	Region	Location
Analyst: Data & Reporting	Select	7504	10/12/2023	New Application	10/12/2023		Region(1)	Location (1)
Auditor	Select	7198	11/11/2023	We are currently reviewing all applications	11/11/2023	We will advise on the outcome of the process as soon as it is finalised.	Region(1)	Location (1)
Auditor: Compliance Audit	Select	7490	17/11/2023	Reject	21/11/2023	Please apply for another opportunity	Region(4)	Location (8)
Auditor: Compliance Audit	Select	7495	22/11/2023	We are currently reviewing all applications	22/11/2023	We will advise on the outcome of the process as soon as it is finalised.	Region(1)	Location (1)
Auditor: Level 3 - (Indirect Tax)	Select	7285	10/11/2023	We are currently reviewing all	10/11/2023	We will advise on the outcome	Region(1)	Location (1)

				applications		of the process as soon as it is finalised.		
Business Area Lead: High Value Debt	Select	6563	10/11/2023	We are currently reviewing all applications	10/11/2023	We will advise on the outcome of the process as soon as it is finalised.	Region(1)	Location (1)
Consultant: HR Business Partnering	Select	7476	15/11/2023	We are currently reviewing all applications	15/11/2023	We will advise on the outcome of the process as soon as it is finalised.	Region(1)	Location (1)
Consultant: Legal Delivery	Select	7294	10/11/2023	We are currently reviewing all applications	10/11/2023	We will advise on the outcome of the process as soon as it is finalised.	Region(1)	Location (1)
Debt Collector (Estates)	Select	7493	22/11/2023	We are currently reviewing all applications	22/11/2023	We will advise on the outcome of the process	Region(1)	Location (1)

						as soon as it is finalised.		
Debt Collector (Estates) 3x	Select	7499	26/11/2023	No longer under consideration	07/12/2023	Please apply for another opportunity	Region(1)	Location (1)

tshingombe fiston <tshingombefiston@gmail.com> Wed, Jan 10, 12:45 PM

to SARB

Active Job Applications

- (102) Robotic Process Automation Engineer - BSTD

  Pretoria, South Africa

- South African Reserve Bank 102 Applied on 12/12/2023

Inactive Job Applications

- (47) Manager - Banking Supervision

  Pretoria, South Africa

  Status Application Unsuccessful

  South African Reserve Bank 47 Applied on 12/12/2023

- (99) Artisan-Electronics CT

  Cape Town, South Africa

  Status Application Unsuccessful

South African Reserve Bank 99 Applied on 12/12/2023

Skip navigation elements to page contents

Workflow

0

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Vacation Rules

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Deliver to me	iRecruitment Notification Workflow	<All>			Inactive
Deliver to me	iRecruitment Notification Workflow	<All>			Inactive

nvoice Summary to fiston tshingombe

Request payment from **fiston tshingombe**. Expenses will be processed once approved by a Collective admin. The amount, description, and your profile name are public, but attachments, payment details, and other personal info is kept private.

engineering databse

Invoice

Submitted by Fistin

Mar 18, 2024

Invoice items

---

engineering data system
Date: December 3, 2024
$10,000,000.00 USD

Total amount $10,000,000.00 USD

Attachments

---

visual tshingombe.pdf

Additional Information

Collective

fiston tshingombe@fiston-tshingombe

Balance:
$1,000,000.00 USD
Pay to

Fistin@fistin

20 percy street 103 jhb jhb 1030 Gauteng
ZA
payout method

Other
Details
engineering data base
Additional invoice information
23

Is this a recurring expense?

Choose this option to automatically submit a copy of this invoice on a periodic basis.
Add notes
(optional)
Collective balance

$1,000,000.00 USD
Fiscal Host
fiston tshingombe

[GitHub] A third-party OAuth application has been added to your account

Inbox

GitHub Mar 16, 2024, 9:12 PM (2 days ago)

to me

Hey t5h2i0tadi!

A third-party OAuth application (Open Collective) with public_repo and read:org scopes was recently authorized to access your account.
Visit https://github.com/settings/connections/applications/af81e50527255ecf7cd6 for more information.

To see this and other security events for your account, visit

https://github.com/settings/security-log

If you run into problems, please contact support by visiting https://github.com/contact

Thanks,
The GitHub Team

Conversation opened. 2 messages. All messages read.

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56 of 4,398
[Grav Community Forum] Confirm your new account

Inbox

Grav Community Forum Sat, Mar 16, 8:46 PM (2 days ago)

Welcome to Grav Community Forum! Click the following link to confirm and activate your new account: https://discourse.getgrav.org/u/activate-account/f851153cb98

Grav Community Forum <notifications@getgrav.discoursemail.com> Sat, Mar 16, 8:47 PM (2 days ago)

to me

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91 of 4,398
dev.azure.com/tshingombefiston0053 is now ready!

Inbox

Azure DevOps Mar 15, 2024, 7:48 PM (3 days ago)

to me

Azure DevOps

Welcome to Azure DevOps

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---

to Azure

Thanks, I'll check it out!

tshingombe fiston 11:49 AM (0 minutes ago)

to Azure

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Skip to main contentAzure DevOps
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/
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Account manager for Tshingombe Tshitadi
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Test Plans
Artifacts
Project settings
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Members
1

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86 of 4,399
Tshingombe Tshitadi reported a new issue in the Visual Studio developer communit

Visual Studio <visualstudio-noreply@microsoft.com> Fri, Mar 15, 9:05 PM (3 days ago)

to me

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Uploaded by Rdferz on April 15, 2025

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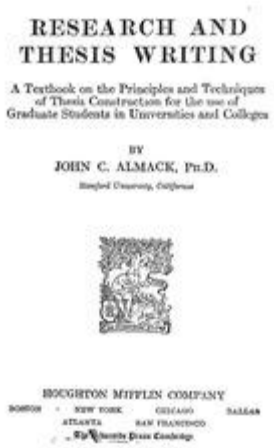

RESEARCH AND
THESIS WRITING

A Textbook on the Principles and Techniques
of Thesis Construction for the use of
Graduate Students in Universities and Colleges

BY
JOHN C. ALMACK, Ph.D.

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[Bachelor thesis - Department of Cybernetics]

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Master of Mechanical Engineering

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[bachelor thesis - SIRET Research Group]

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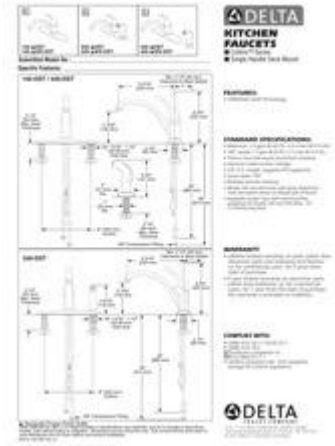

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2	IJETR3155	project career master job engineering thesis master rural experimental electrical engineering	Volume 15 Issue 1	Paper Accepted	22-Jan-2025	Pending	
3	IJETR3156	project career master engineering electrical career mentor job	Volume 15 Issue 1	Paper Accepted	22-Jan-2025	Pending	

Incident logged on 2025/04/15 12:34:19 PM (UTC 02:00) - Africa/Johannesburg; was resolved on 2025/04/17 8:52:30 AM (UTC 02:00) - Africa/Johannesburg

Inbox

CS

csd@treasury.gov.za 8:53 AM (1 hour ago)

to me

Dear Tshingombe Fiston,

We are committed to providing you with an EXCELLENT CUSTOMER SERVICE experience. We would like your feedback about the manner in which we handled your query/request.

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Incident# 2165503 has been resolved:

Resolution

Insufficient Information (Lungile)

Incident #	**2165503**
Summary:	Re: engineering
Customer Name:	Tshingombe Fiston
Location:	
Priority:	3
Status:	Resolved
Category:	Following up on Issue / Query
Resolved On:	2025/04/17 8:52:30 AM (UTC 02:00) - Africa/Johannesburg

Description

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List of Applications

Concept Notes

Concept Notes for Large Integrated Projects Foundational Biodiversity Information Programme

FBIC250410310077
10/04/2025
Application Complete

Institutional Grants

SARChI Communities of Practice

COP250411310245
11/04/2025
Application In Progress

DSTI/NRF- Basic Sciences Research Chairs

SARC250414310630
14/04/2025
Application In Progress

Non-funding Opportunities

NRF Awards

NONF250411310281
11/04/2025
Application Complete

Postdoctoral Grants

NRF Postdoctoral Grants

PSTD250411310291
11/04/2025
Application In Progress

Research Grants

Foundational Biodiversity Information Programme (FBIP) - Small Grants

FBIS250411310247
11/04/2025
Application In Progress

Support for Y-rated Researchers

CSRP250411310248
11/04/2025
Application In Progress

Thuthuka PhD Track

TTK250411310249
11/04/2025
Application In Progress

Thuthuka Post PhD Track
Thuthuka Rating Track

TTK250411310253
11/04/2025
Application In Progress

Black Academics Advancement Programme PhD Track

NFSG250411310255
11/04/2025
Application In Progress

Black Academics Advancement Programme Post PhD Track

NFSG250411310256
11/04/2025
Application In Progress

NFSG250411310257
11/04/2025
Application In Progress

Africa-UK Physics Partnership

AUPP250414310636
14/04/2025
Application In Progress

On Fri, Apr 11, 2025 at 2:58 PM tshingombe fiston > wrote:
tshingombe fiston >

_____

NRF Connect: NRF Awards Details of Nomination

_____

NRF Connect > Fri, Apr 11, 2025 at 11:56 AM
To: tshingombe tshingombe >

Dear Mrtshingombe tshingombe

You have been nominated for the 2023 NRF Awards,

Category of nomination:Research Excellence Award for Early Career/Emerging Researchers by Mrtshingombe tshingombe for application with reference number NONF250411310281 Kindly follow the link (https://nrfconnect.nrf.ac.za) to login to NRF Connect; once you have logged into the system, click on the Acceptance of Nomination menu item under the My Applications heading to accept the nomination.

Regards
NRF Awards Call

On Fri, Apr 11, 2025 at 2:37 PM tshingombe fiston > wrote:

On Fri, Apr 11, 2025 at 2:12 PM tshingombe fiston > wrote:
Click on any field below to edit it
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Page URL * https://archive.org/details/thesi-project-book-final-engineerin-tshingombe-time-table-allocation-job-cost
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unnamed(8).jpg 71 KB [https://archive.org/upload/img/removered.png]

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* Please consult relevant Call documents at: NRF Call for Proposals for Funding in 2023 and 2024– National Research Foundation.
* Acceptance of Award guide: https://www.nrf.ac.za/nrf-connect/nrf-connect-documents/
* SARAO Postgraduate Scholarship Application Guide: SARAO Postgraduate Scholarships Application Guide for the 2024 Academic Year
The 2024 NRF Next Generation and Emerging Researchers Symposium

The NRF is launching the Next Generation and Emerging Researchers Symposium in October 2024. This symposium aims to create a platform for 300 postgraduate students and emerging researchers to connect, exchange knowledge, and share innovative research projects.
The symposium will align with the abstracts via NRFConnect. Read here: https://www.nrf.ac.za/the-2024 nrf-next-generation-and-emerging-researchers-symposium.
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11/04/2025

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TTK250411310249
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Industrial and economic sociology
Analytical Environmental Chemistry
Applied Chemistry - Membrane Technology
Nanostructured materials and packaging
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REPUBLIC OF SOUTH AFRICA

SECTOR SPECIFIC ASSISTANCE SCHEME (SSAS)

APPLICATION FOR PROJECT FUNDING

1. CATEGORY OF ORGANISATION

☐ Export Council

☐ Industry Association

☐ Joint Action Group

2. NAME OF ORGANISATION (incl. VAT and registration numbers in the case of registered organisations) AND CONTACT DETAILS

Engineering tshingombe st peace college

3. TOTAL PROJECT COSTS

R500000

4. TITLE AND BRIEF DESCRIPTION OF THE PROJECT

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1 .1.1 *Thesis: * Research policy trade theory minimum : legislation skill development : honorable member certificate transcript outcome award
tshingombe tshitadi, tshingombekb@gmail.com tshingombekb@gmail.com, info@email.careersportal.co.za *et al*

5. AIMS AND OBJECTIVES OF PROJECT

Resolve industrial rural trade master skill engineering and education technology manufacture related regulation and irregularity combination system vocationel trade and university capacity development

6. OUTCOME OF PROJECT

Project development research fund rural system integrity entry outcome news system correct education merge line in industrial production training record customer regulation production arketing research course issue

7. HOW WILL THIS PROJECT CONTRIBUTE TOWARDS:

Broad-based Black Economic Empowerment	**Good field design**
Women Empowerment	**yes**
Youth Empowerment	**yes**

Persons with Disabilities	**yes**
SMME Development	**yes**
The Development of Exports	**yes**
The Development of Exporters	**yes**
The Development of your Industry Sector	**yes**
The Green economy	**yes**
Local economy	**yes**
Reducing import of products	**yes**

8. HOW DID YOU ESTABLISH WHETHER THE PROJECT IS FEASIBLE?

The proect is faisability college and university training compagny and industrial sociaty college inititu university

9. **HOW DID YOU ESTABLISH WHETHER THE PROJECT HAS THE SUPPORT OF COMPANIES IN YOUR SECTOR?**

To hr compagny design system integrity

10. **ARE THERE ANY SIMILAR OR COMPLEMENTARY PROJECTS / INITITIAVES THAT ALREADY HAVE BEEN OR WILL BE IMPLEMENTED IN YOUR SECTOR? IF SO PLEASE PROVIDE DETAILS.**

Yes is programe on industrial subject field

11. **HAVE YOU INVESTIGATED ALTERNATIVE SOURCES OF FUNDING, AND WILL THIS PROJECT OBTAIN FUNDING FROM OTHER SOURCES? IF SO PLEASE PROVIDE DETAILS**

We investigate national research fund and university

12. **WHAT OTHER PROJECTS HAVE YOU APPLIED FOR OR INTEND APPLYING FOR UNDER SSAS PROJECT FUNDING? WHAT IS THE RELATIONSHIP BETWEEN THE PROJECTS IF ANY?**

The project applied in system education training resource lab workshop and experimental ,nn diploma , sita back log

13. MOTIVATE YOUR SELECTION OF SERVICE PROVIDER/S BASED ON THE THREE QUOTES YOU ATTACH TO YOUR APPLICATION

We make subject module lms self review

14. COST BREAKDOWN STRUCTURE Table 1

Activity	Description of Activity	Amount
Training on line Nrf ,dts	Training career written job design	100000

15. MILESTONES AND TIMELINES Table 2

Milestones	Start Date	End Date
1	2022	2027
2		
3		
4		
5		

16. DECLARATION

I hereby request project funding under the Sector Specific Assistance Scheme (SSAS). I will only incur expenditure in this regard after receiving a Letter of Approval for Funding under the Sector Specific Assistance Scheme from **the dtic**. If engaging the services of third party service providers, I will make certain that I obtain and provide proof of three quotations for all services, and will ensure that the quotes reflect market-related rates. I understand and accept all the rules pertaining to the Sector Specific Assistance Scheme, as indicated in the Rules and Guidelines of the Sector Specific Assistance Scheme. I declare that the information provided herein is true and correct. I also declare that I have not/will not apply for funding from any other financial assistance scheme, neither from **the dtic**, nor from any other government (national, local and municipal) or quasi-government institution in respect of this project.

NAME OF APPLICANT:

SIGNATURE OF APPLICANT:

DATE:

17. NOTICE OF PROCESSING OF PERSONAL INFORMATION IN TERMS OF THE PROTECTION OF PERSONAL INFORMATION ACT, NO. 4 OF 2013

The Department of Trade, Industry and Competition (**the dtic)** processes personal information in lieu of the business activities that it performs. The department uses this

information to provide **the dtic's** products or services to you, to carry out the transactions requested by you and to maintain a relationship with you.

In the majority of instances personal information will be collected directly from you through application forms, email, telephone calls, etc. **the dtic** may, however, also supplement the information that you provide with information received from other governmental bodies such as the South African Revenue Service, Home Affairs, Development Finance Institutions and other Government entities.

The provision of the personal information is voluntary, but please note that there might be consequences if you do not consent to **the dtic** processing your information. For example, the Department might not be able to decide on your application for an incentive grant/claim.

the dtic may disclose your personal information to third parties that require it for the purposes of performing their functions for which functions may be related to the functions which the dtic is performing. Please note that **the dtic**, unless legally obliged to share your personal information, will only share so much of your personal information as is needed by the third party that requires it, and we will only do so when it is necessary for **the dtic** to perform its functions.

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Where applicable, certain Acts administered by the dtic requires that information, including personal information, be processed by **the dtic**. These, amongst others, include:

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Consumer Protection Act, 2008 (Act No. 68 of 2008);

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Lotteries Act, 1997 (Act No. 57 of 1997)

Patents Act, 1978 (Act No. 57 of 1978);

Registration of Copyright in Cinematograph Films Act, 1977 (Act No. 62 of 1977);

Trade Marks Act, 1993 (Act No. 194 of 1993);

Manufacturing Development 1993 (Act No. 187 of 1993);

Special Economic Zones 2014 (Act No. 16 of 2014).

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Compensation for Occupational Injuries and Diseases Act, 1993 (Act No. 130 of 1993);

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Computer Evidence Act, 1983 (Act No. 57 of 1983);

Electronic Communication and Transaction Act, 2005 (Act No. 25 of 2005);

Employment Equity Act, 1998 (Act No. 55 of 1998);

Financial Intelligence Centre Act, 2001 (Act No. 38 of 2001);

Income Tax Act, 1962 (Act No. 58 of 1962);

Labour Relations Act, 1995, (Act No. 66 of 1995);

National Archives of South Africa Act, 1996 (Act No. 43 of 1996);

Occupational Health and Safety Act, 1993 (Act No. 85 of 1993);

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JD House, 27 Stiemens Street, Braamfontein, Johannesburg, 2001

P.O Box 31533, Braamfontein, Johannesburg, 2017

Complaints email: POPIAComplaints@inforegulator.org.za

General enquiries email: enquiries@inforegulator.org.za.

By signing this notice you acknowledge that you have been made aware of how and why **the dtic** processes personal information.

SIGNED BY _tshingombe tshitadi _____ AT _____jhb_____(place)

_____tshingombe_____

_____06/04/2025_____

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/usr/bin/git log -1 --format='%H'
'76fb7a88c75b72824ac138782ca3220dbb7de621'
0s
Run echo Hello, world!
Hello, world!
0s
Run echo Add other actions to build,
Add other actions to build,
test, and deploy your project.

0s
Post job cleanup.
/usr/bin/git version
git version 2.43.2
Temporarily overriding HOME='/home/runner/work/_temp/97b82adb-aa33-4005-a32b-b414b5ef0e87' before making global git config changes
Adding repository directory to the temporary git global config as a safe directory
/usr/bin/git config --global --add safe.directory /home/runner/work/t5h2i0tadi/t5h2i0tadi
/usr/bin/git config --local --name-only --get-regexp core\.sshCommand
/usr/bin/git submodule foreach --recursive sh -c "git config --local --name-only --get-regexp 'core\.sshCommand' && git config --local --unset-all 'core.sshCommand' || :"
/usr/bin/git config --local --name-only --get-regexp http\.https\:\/\/github\.com\/\.extraheader
http.https://github.com/.extraheader
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Course Modules Overview 1.engineering electrical

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First Module for Evaluation

Created: 2025-04-09 07:54:22

Last Edited: 2025-04-17 08:23:31

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Course Structure
My first Module: Course Modules Overview 1. Core Knowledge and Theory Modules: o The Electrical Trad

Learning Outcomes

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+ Add a New Page or Question

Topic 2 : Untitled

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Topic 3 : Untitled

Page 1

+ Add a New Page or Question

Lesson Summary

Manage Your Content

Our manager will allow you easy access to parts of your course or to Edit, Move, Duplicate and Delete your content simply by selecting an element from the tree.

-

- Use the Import tool to import modules from another course.
- • Use the Collapse tool to collapse the tree.
- • Use the Plus tool to create new elements.

- • Use the Edit tool to re-edit a name or a description.
- • Use the Duplicate tool to duplicate a module, a page or a question.
- • Use the Delete tool to delete a selected element from the tree.
- • Hold and drag to rearrange topics/modules/ assessments.
- • This icon represents a Module
    - • This icon represents an assessment
    - Red Dots indicate sections that have not passed the review and require edits

---

tshingombe fiston <tshingombefiston@gmail.com> Mon, Apr 14, 2025 at 2:34 PM

To: InternetArchive.hr@adp.com

Dev Ops/SRE Engineer

Projects archive.orgUS

+1 More Locations

Salary Range

120000.00 To 140000.00 (USD) Annually

30+ days agoRequisition ID: 1006Applied: 04/14/2025

Job Details

The Internet Archive is looking for an expert DevOps / SRE engineer to join the UX Team, working remotely.

You will be one of the primary engineers responsible for the Archive.org website (a Top 250 website) and related services. You will be in charge of maintaining and developing the mostly Ansible-managed production cluster, provisioning and configuring servers, maintaining applications, setting up monitoring and alerts, and generally helping keep things running smoothly. There is also the possibility of contributing to front-end development and participating in other UX-related activities. This is a rare opportunity to become a critical member of a small team making a huge impact in the world.

Responsibilities:

- Operationally maintaining Archive.org servers and services
- Maintaining and evolving the Ansible-based provisioning and configuration infrastructure
- Collaboratively managing the deployment architecture of our staging and production apps
- Setting up and maintaining monitoring and alerts
- Identifying and triaging problems when they arise; researching, building consensus around, and implementing solutions
- Responding to external stakeholders who have apps hosted in our server cluster
- Working with other DevOps engineers, both on the UX Team and on other teams
- Communicating effectively with stakeholders
- Reducing technical debt
- Being a role model for effective and collaborative engineering practices
- Maintaining the blog and other Wordpress sites

Requirements:

- 3+ years of relevant work experience in a collaborative software development environment
- Strong Linux system administration skills
- Expertise with maintaining and optimizing a server cluster through time
- Experience setting up monitoring and alerting at all levels within a system
- Excellent problem-solving and debugging skills
- Excellent verbal and written communication skills
- Familiarity with website and server security
- Comfort working in a loosely structured environment requiring individual autonomy and initiative within one's scope of responsibilities
- Willingness to learn and change, reach compromise with others
- Remote work with occasional optional on-sites

Preferred Skills:

- Automated server provisioning with Ansible (or similar tooling)

- Web servers, load-balancing, and caching (e.g. nginx, HAProxy)
- Network & DNS configuration
- Containerization and clustering (e.g. Docker, nomad, consul)
- Monitoring and observability (e.g. Grafana, Prometheus, Loki, Sentry)
- Git, GitLab
- JIRA, Agile-ish software development

About Us:
We are a 501(c)(3) non-profit digital research library with a bold mission: to provide universal access to all knowledge—including the books, music, images, audio, television, websites, and software that form our shared human culture. Our dedicated team of engineers, archivists, librarians, and other professionals has created one of the world's top 300 websites, archive.org. Each day, the Internet Archive digitizes thousands of books and captures hundreds of millions of web pages weekly. Over the past 25 years, we have built one of the largest digital libraries in existence, serving millions of people worldwide. This achievement is made possible through collaborations with hundreds of libraries, archives, museums, universities, and non-profits across the globe.

Benefits & Perks:
The Internet Archive provides a comprehensive benefits package including: PTO, paid holidays, medical, dental, vision, FSA, commuter, STD, LTD, 401K/Roth accounts. Work-life balance is important to us. For engineers located near HQ, we offer catered Friday lunches.

Internet Archive is an Equal Opportunity Employer M/F/D/V/L/G/B/T and will consider for employment qualified applicants with criminal histories in a manner consistent with the requirements of the Fair Chance Ordinance.

crofiche Digitization Technician

Northern Lights Digital LibraryFull Time San Francisco, CA, US

Salary Range

18 To 23 (USD) Hourly

12 days agoRequisition ID: 1014Applied: 04/14/2025

Job Details

The ***Microfiche Digitization Technician*** will operate a microfiche digitization station that takes digital photos of microfiche cards from various collections and displays them online for universal access.

The Internet Archive is a non-profit organization working with 80+ world-class universities and libraries to create the world's largest digital open library. We partner with many institutions to digitize and share unique collections of print and microform materials.

Gain experience in the following fields of endeavor: building an open source digital library, digital photography and digital scanning software, metadata management, preservation and handling of micro format material, presentation and production of digital books.

Responsibilities and Duties

We are looking for a Microfiche Digitization Technician who is motivated, conscientious, detail-oriented, and who has the ability to work efficiently and independently in a quiet, low-stress work environment.

- Digitally capture and review images of microfiche books, periodicals and manuscripts using documented processes and procedures, at an established production rate.
- A high tolerance for repetitive tasks and expert attention to detail is necessary.
- Ability to assess image quality and determine if an image requires rework.
- Ability to communicate with others about problems.
- Working knowledge of computers - strong technical skills are preferred.
- Must be able to carefully move materials (5-40 lbs. each) short distances, using standard workplace processes; sit or stand at a microfiche station.
- Strong written and verbal communications skills.
- Ability to receive feedback and give feedback in a friendly, professional manner.
- Preferred skills: photography knowledge and/or interest in film, experience

with film scanning or past work in a library setting.

Physical/Special Requirements

Walking: Ability to move about on foot to accomplish tasks, to pick up materials to scan.
Lifting: Ability to raise and lower objects horizontally from position to position and lift up to 40 pounds safely.
Seeing: Required to have close visual acuity to determine the accuracy, and clarity of images during digitization.
Sitting/Standing: Works at a computer 100% of the time. Must be able to sit or stand at a microfiche scanning station for full shift length.
Dexterity: Ability to use hands and arms to move microfiche material on/off the platen. This activity occurs throughout the work day.

Cognitive Considerations

- Must have the ability to read, write in English and organize materials.
- Ability to maintain constant focus on digitization workflow.
- Must exhibit good safety awareness and judgment.

Must have availability Monday to Friday to work in Richmond, California 7:30 AM - 3:30 PM. Must have own transportation as the site is not well served by public transit.

Tell us about why you would like to join our team and what aspects of your work experience you think will be an asset to the project. All types of work experience is highly encouraged. We are grateful to all applicants but may only respond to those inquiries we would like to proceed with.

Internet Archive is committed to an equitable, diverse, and inclusive workforce. We welcome applications from all qualified persons. We encourage women; members of

visible minority groups; persons with disabilities; persons of any sexual orientation or gender identity and expression; and all those who may contribute to the further diversification of ideas and perspectives to apply.

ackend Software Engineer

Web Archive itUS

Salary Range

80000.00 To 135000.00 (USD) Annually

23 days agoRequisition ID: 1013Applied: 04/14/2025

Job Details

Interested in a mission-driven job ensuring open access to information for a global audience? Enjoy building products critical to thousands of libraries, non-profits, cultural heritage, and educational organizations worldwide? **Internet Archive is seeking a backend software engineer for its Archiving & Data Services team.** Internet Archive (IA) is a non-profit digital library, top 200 website at archive.org, and an archive of over 150 petabytes of digital information running in many self-owned and operated data centers. Internet Archive also provides mission-aligned services to thousands of organizations worldwide, working collaboratively to advance our goal of "Universal Access to All Knowledge."

Key Responsibilities

- Design, build, and maintain the core systems and applications powering Internet Archive's services
- Build without the cloud in our on-premises data centers
- Ensure our core services meet the needs of our user-facing applications
- Identify and address performance bottlenecks as we continue growing our collections at an exponential rate
- Write automated tests for everything you build
- Perform security maintenance and address technical debt in security-critical components
- Diagnose system operational problems quickly and effectively
- Help maintain stateful infrastructure like Postgres, Elasticsearch, and HDFS

Basic Qualifications

- Minimum of 2 years of experience in software engineering for web applications and the systems that support them
- Strong programming skills
- Excellent interpersonal/communication skills, and the ability to work as part of a team
- Ability to plan, organize, prioritize tasks, and complete assigned projects with minimal supervision

Preferred Qualifications

- Experience building without the aid of cloud services (we own and operate our own data centers)
- Experience building, and maintaining web applications with Python and PHP

- Experience developing Java applications
- Experience optimizing and maintaining stateful systems like Postgres, Elasticsearch, and HDFS
- Experience working on high traffic web applications
- Strong troubleshooting and dynamic analysis skills
- Strong working knowledge of Linux and networked computing environments

Job Details

This is a remote-first position working in a distributed team. Candidates will need to have significant working hour overlap with Pacific Time Zone based colleagues. The general salary range is $85,000 to $135,000, variable according to a candidate's level of experience and work location. Candidates must be a U.S. Citizen or a U.S. Resident with authorization to work. References must be made available upon request.

Benefits & Perks

The Internet Archive is a remote first workplace and provides a comprehensive benefits package including; PTO, paid holidays, and medical benefits. Depending on where you live, we also provide these additional benefits; dental, vision, health savings accounts, flex spending accounts, commuter benefits, short term disability, long term disability and retirement programs. At the Internet Archive, we believe we do our best work when our employees bring together diverse ideas. Members of all groups under represented in the tech industry and library world are strongly encouraged to apply. We are proud to be an equal opportunity workplace and are committed to equal employment opportunity regardless of race, color, religion, national origin, age, sex, marital status, ancestry, physical or mental disability, genetic information, veteran status, gender identity or expression, sexual orientation, or any other characteristic protected by applicable federal, state or l

Welcome, tshingombe tshitadi

My Profile

We have collected the following information from your resume. Please review, before saving your profile. By saving, you accept that the information is accurate.

Personal Info

tshingombetshitaditshitadi

(72) 529-8946

You have not opted to receive text messages. To change the preferenceClick Here

tshingombefiston@gmail.com

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Johannesburg, Gauteng 2198

City of Johannesburg Metropolitan Municipality

South Africa

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Voluntary Self-Identification

Gender

Man

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Protected Veteran Status

I decline to self-identify.

Section 503 Disability Status

I Don’t Wish to Answer

Update

Resume

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Updated On 04/14/2025

Update

Areas of Interest

engineering

Please correct the errors.

Experience

(No Job Title)

Please correct the errors.

Education

Degree information is required.SAQA AND COLLEGE03/10/2024 - 03/10/2025

Skills

What work-related skills do you have?

Delete My Profile

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Determining the checkout info

Checking out the ref

/usr/bin/git log -1 --format='%H'

'76fb7a88c75b72824ac138782ca3220dbb7de621'

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Run echo Hello, world!

Hello, world!

0s

Run echo Add other actions to build,

Add other actions to build,

test, and deploy your project.

0s

Post job cleanup.

/usr/bin/git version

git version 2.43.2

Temporarily overriding HOME='/home/runner/work/_temp/97b82adb-aa33-4005-a32b-b414b5ef0e87' before making global git

config changes

Adding repository directory to the temporary git global config as a safe directory

/usr/bin/git config --global --add safe.directory /home/runner/work/t5h2i0tadi/t5h2i0tadi

/usr/bin/git config --local --name-only --get-regexp core\.sshCommand

/usr/bin/git submodule foreach --recursive sh -c "git config --local --name-only --get-regexp 'core\.sshCommand' && git config

--local --unset-all 'core.sshCommand' || :"

/usr/bin/git config --local --name-only --get-regexp http\.https\:\/\/github\.com\/\.extraheader

http.https://github.com/.extraheader

/usr/bin/git config --local --unset-all http.https://github.com/.extraheader

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1. Your updated CV
2. Previous degree completed
3. Personal statement discussing your personal motivation for your research, what paradigms will be broken when your research is complete and what is your vision once you complete your research
4. Proposal for groundbreaking research in your field that you will pursue and develop with AIU

Qualifications

To qualify for the disruptive innovator grant, you must hold a Masters or PhD or an equivalent of a doctoral degree. The doctorate or equivalent must have been awarded within the last five years and candidate must not have exceeded five years of prior postdoctoral experience.

Responsibilities

Research within your field in business and economics, social and human studies or science and engineering an innovative topic to conduct research. Culminating with your thesis defense and participation in our university symposium. Mentoring first and second-year student teams applying critical thinking to solving problems of global importance.

granteed application

Inbox

t

tshingombe fiston <tshingombefiston@gmail.com> Tue, Feb 25, 3:19 PM

to me

Skip to content

Navigation Menu

- Settings
- Developer Settings

GitLab.com has been revoked from your account.

Kananga5 (Kananga5) settings

Your personal account

-

Applications

-
- Authorized OAuth Apps

You have granted **11 applications** access to your account.
AppVeyor CI

Last used within the last 10 months · Owned by appveyor

Azure Pipelines (OAuth)

Last used within the last 8 months · Owned by
AzurePipelines

codebeat

Last used within the last week · Owned by codequest-eu

codefactor.io

Last used within the last 8 months · Owned by codefactor-io

codefactor.io

Last used within the last 8 months · Owned by codefactor-io

DataStax Astra DB

Last used within the last 8 months · Owned by datastax

lambdatest.com

Last used within the last 9 months · Owned by LambdaTest

Microsoft Events

Last used within the last 10 months · Owned by MS-Events

Microsoft-Corporation

Last used within the last week · Owned by Microsoft-corp

Octobox

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Open Collective

Last used within the last 2 weeks · Owned by

opencollective

Read more about connecting with third-party applications at GitHub Help.

Footer

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- Status
- Docs
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-
-
- # Access
  -
-
-
-
- # Code, planning, and automation
  -
-
- # Security

Gmail

tshingombe fiston
<tshingombefiston@gmail.com>

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project nfs

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tshingombe fiston <tshingombefiston@gmail.com> Tue, Feb 25, 2025 at 10:56 AM

To: tshingombe fiston <tshingombefiston@gmail.com>, tshigombekb@gmail.com

I-Corps Executive Summary ID :

P-09874

Academic Institution :

Engineering electrical tshingombe

Entrepreneurial Lead :

tshingombe tshitadi

Entrepreneurial Lead Email :

Email tshingombefiston@gmail.com

Entrepreneurial Lead Qualification :

Engineering electrical

Technical Lead :

tshingombe tshitadi

Technical Lead Email :

Email tshingombefiston@gmail.com

Technical Lead Qualification :

Information technology

I-Corps Mentor :

tshingombe tshitadi

I-Corps Mentor Email :

Email tshingombefiston@gmail.com

I-Corps Mentor Qualification :

Information

Should your team be invited to submit an I-Corps Teams grant proposal, who will be submitting the grant proposal as PI :

Entrepreneurial Lead (EL)

Is your team submitting from another federal agency? If so, please select from the drop down below :

Other Agency

There are two pathways to establish for the NSF I-Corps Teams program. Which is your team claiming :

Relevant current/previous NSF research award

Current/Previous NSF Research Award # :

Engineering

What is the IP status of the innovation :

Patent issued

Patent Number :

1234567891234567891

Brief Description of Technology (Intellectual Merit) :

Engineering electrical award degre diploma framework qualifications graduate resarch national trade diploma regulation certificate outcome job assessments enginering electrical master advance technologie implementation framework language..

Brief Description of Commercial Applications (Broader Impacts) :

Engineering electricsl frameworks low ruling irregularity regulation bsck log delivery

Brief Description of Current Commercialization Plan :

Planning auditing enginering electrical snf onformstion intellectual computer project ..portofolio

Status :

Declined

Submitted Date :

Dec 19, 2024

Email tshingombefiston@gmail.com

I-Corps Mentor Qualification :

Information

Should your team be invited to submit an I-Corps Teams grant proposal, who will be submitting the grant proposal as PI :

Entrepreneurial Lead (EL)

Is your team submitting from another federal agency? If so, please select from the drop down below :

Other Agency

There are two pathways to establish for the NSF I-Corps Teams program. Which is your team claiming :

Relevant current/previous NSF research award

Current/Previous NSF Research Award # :

Engineering

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Brief Description of Current Commercialization Plan :

Planning auditing enginering electrical snf onformstion intellectual computer project ..portofolio

Status :

Declined

Submitted Date :

Dec 19, 2024

Dear tshingombe,

Here is the copy of the Project Pitch with reference number : **00095759** submitted to the

Advanced Manufacturing (M) on **12/18/2024**.

1. Submitter Email

tshingombefiston@gmail.com

2. Submitter First Name

tshingombe

3. Submitter Last Name

tshitadi

4. Submitter Phone Number

0725298946

5. Company Name

Engineering electrical tshingombe

6. Company Zip Code

10300

7. Company State

AK

8. Company Website

htpps//:www.tshingimbefiston.com

9. SBIR/STTR topic that best fits your projects technology area

Advanced Manufacturing (M)

Are you eligible and interested in being considered for the NSF Fast-Track program?

Yes

Please provide details of the NSF research funding relied upon to meet the eligibility

requirements, including: NSF research award number(s); the proposing company personnel

involved in each of the listed research awards and their roles in the research awards; and a brief

explanation of how the cited research funding relates to the proposed Fast-Track project. (up to

150 words)

Engineering electrical master skill ,manufacture

Please provide details of the customer discovery training relied upon to meet the eligibility

conditions, including: a description of the customer discovery training program(s), with

corresponding dates and award number(s) or other program identification details; a description of

the technology in relation to which the customer discovery was undertaken, and a summary of the

customer discovery findings. (Up to 250 words) Engineering electrical manucture electrotech

Please check the appropriate box below to indicate whether the proposing Fast-Track team will

be complete at the time of proposal submission.

Yes

10. Is this Project Pitch for a technology or project concept that was previously submitted as a full

proposal by your company to the NSF SBIR/STTR Phase I Program – and was not awarded ?

Yes

Please provide the Proposal Number of the previously submitted full NSF SBIR/STTR Phase I

proposal ?

1234567

Have you contacted the associated NSF SBIR/STTR Program Officer, via email or phone, to

discuss this prior full proposal submission?

Engineering electrical

11. Has your company received a prior NSF SBIR or STTR award?

Yes

Please provide the Proposal Number of the previously submitted full NSF SBIR/STTR Phase I

proposal ?

1234567

12. Does your company currently have a full Phase I SBIR or STTR proposal under review at

NSF?

Yes

13. Briefly Describe the Technology Innovation?engineering electrical-Proposal of thesis content / final project

Content

1 .name of thesis

2.index

3. Introduction.

4.description .

5.general.analizing

6.current information .

7.discussion

8 conclusion.

9. Bibliography.

_____

1.Name of thesis : implementation and framework national qualification

and national trade examination circulum experimental job theoretical

pratical college and government policy LMS in engineering studies

science electrical businesses module: case studies rsa in dhet,saqa ,

St peace college

2. Index: topic achieve research advance field basic field , essential

filling research circulum, fundation intermediate,elementaire

3.Introduction : the core and research advanced field experience of

sciences engineering electrical study and implement programme in social

education and industrial trade vocational career productu sector in

energy electrical and science engineering field system need to learn and

re implement system information management system sector opportunity

and through activities investment horizontal creation of equitable

distribution: transformer science engineering and electrical product

method learn capacity generative intelligence systems of linear

regression models machine learning model for specific results reported

that they haveA Mon other aspirations Isreal parameter real power factor

and Imagineer power factor ,, need to resolved system exper and

artificial intelligence system rural development system residential

dispatch deployment system and framework qualification mean regulation

humain resource and material work trade design career center to make

system LMS factor adaptation between robot science trade elementary work

trainer training phase products and systems industrial generator

entrepreneurs in same order phase assessment news field and

compensation.problem ask rural development need new training order

framework to qualicafition requested requalification redesign

equivalents system , occupation framework system between national

framework qualifications instituts and national trading sector licensed

theory and practical in nature and creative abilities,

-typical evry country or landscape will be in a constant state of design

system in ,,,,

Large measure unpredictable and this city or village at different paint

of time ,, implementation the Grove years of failed turound ..

4.desceiption :at the heart of solutions to framework

qualicafition and

national trade implementation sub sector training trainer experiementalwork place industrial more student and instituts college trade years

external internal work value increase price macro economics instability

Crete ,.sice accentuated by advertising shortage high inflation levek

rising unemployment capacity industrial trademarks society system and

materials adequately support trade training QMS system information

commissioner,to under utilities in the address desterious policy design

implementation ,

5. General analysis: in order to break the successful it has become

social contract principle in

14. Briefly Describe the Technical Objectives and Challenges?Engineering-6 current information:

In working to formatted a trade framework qualic

For the turnaround ,the following

- objective.

- the diagnosis the fundamental strategies instituts framework

qualicafition national equivalent national trade international sector

approval occupation council trade council engineering sector portal

career design to synchronise system adaptative sector LMS learner

engineering competition grade post senior principal, engineering

electrical ,tradesman wire ,cadet minim system up date successful system

in design grade operational, framework award qualifition research

undertake material test week conductor atom technical engineering

innovation learn teach research mark method marks need to implement

adaptative system , research topics circulum regulation irregularity

material script, backlog system , combination system ,printer and system

need to make synchronise system deploy generative job framework

undercover job in next generation must going

- to discern and isolate the sicio economic environment engineering

system trade safety security police , commissioner trade need to meet

requirements qualicafition framework and the framework must also show in

the social successful but framework it increases by outage loadshedding

and social down to declined empirical experiemental in other

contemporary ,the regret filled job no successful for time table printer

system or computers system experiemental make design advanced research ,

-7. discussion the objective is to explore that strategies and situation

where Rapide performance import. Trade theory..

- conclusion:

Whilst the field of strategy has be explored extensively in vast to

trade framework qualifications need to requalification system was

temporarily qualify expire system in job work sector training

and

regulations system industrial system need cpd to continue system and

subject short and gate more skill job was slow operational field basic

in basic was poorly no attandance system advance essential field job

make support frame commissioner no meeting system trade retrade was not

in the same ways Orders orientation industrial, imperative hard, largely

,the research interest and how a fruit full common,ground can be

established.

- one of the critical virtues of the proposal thesis that it

Engineering electrical science make in order to stabilize thought

transfer the vei ld consensus building in ,,- the thesis is ,, model design

Policy commissioner vs learn vs teacher vs ,, framework national trade

vs company property intellectuel business electrical system need to

meeting...wrong model design topic ,, research rural energy design

framework , and orientation system learner teach career mentor

faciltor purpose framework,leaver school need to meeting,

Design two g city design systeme economic revenue bank system portal

need sector trade to work in place electrical designer b Poste trade

case research job workplace resulted was recruited need printer pool

position rank no waiting

- 8 bibliography:

- tshingombe 2023_2924 < Poe's published,,educ technology, magazine net

database, St peace college.

Record book completed

- web TVET dhet ,saqa wab

- alu

_____

Graduation procedure form . congratulations programme , diploma .

-1 data verification.

- grade | description| point | numeracy

15. Briefly Describe the Market Opportunity?

engineering electrical

16. Briefly Describe the Company and Team?

Engineering electrical master

17. How did you first hear about our program?

NSF email, webinar, or event

NSF SBIR/STTR Phase I Eligibility Information:

In addition to receiving an invitation to submit a full proposal from the NSF SBIR/STTR Phase I

Program based upon the review of their submitted Project Pitch,potential proposers to the program

must also qualify as a small business concern to participate in the program (see SBIR/STTR

Eligibility Guidefor more information).

The firm must be in compliance with the SBIR/STTR Policy Directive(s) and the Code of Federal

Regulations (13 CFR 121).

• Your company must be a small business (fewer than 500 employees) located in the United

States. Please note that the size limit of 500 employees includes affiliates.

• At least 50% of your company's equity must be owned by U.S. citizens or permanent residents,

and all funded work needs to take place in the United States (including work done by consultants

and contractors).• Primary employment is defined as at least 51 percent employed by the small business. NSF

normally considers a full-time work week to be 40 hours and considers employment elsewhere

of greater than 19.6 hours per week to be in conflict with this requirement.

• The Principal Investigator needs to commit to at least one month (173 hours) of effort to the

funded project, per six months of project duration.

For more detailed information, please refer to the SBIR/STTR Eligibility Guide by using

https://www.sbir.gov/sites/default/files/elig_size_compliance_guide.pdf. Please note that these

requirements need to be satisfied at the time an SBIR/STTR award is made, and not necessarily

when the proposal is submitted.

Dear fiston,

Here is the copy of the Project Pitch with reference number : **00098889** submitted to the **Energy**

Technologies (EN) on **2/25/2025**.

1. Submitter Email

tshingombefiston@gmail.com

2. Submitter First Name

fiston

3. Submitter Last Name

tshingombe

4. Submitter Phone Number

0725298946

5. Company Name

Engineering electrical tshingombe

6. Company Zip Code

10300

7. Company State

AR

8. Company Website

https://github.com/Kananga5/Curriculum-section-1-1.1-Thesis.-Degree

honor-council-quality-rules-low-become-ju

9. SBIR/STTR topic that best fits your projects technology area

Energy Technologies (EN)

Are you eligible and interested in being considered for the NSF Fast-Track program?

Yes

Please provide details of the NSF research funding relied upon to meet the eligibility

requirements, including: NSF research award number(s); the proposing company personnel

involved in each of the listed research awards and their roles in the research awards; and a brief

explanation of how the cited research funding relates to the proposed Fast-Track project. (up to

150 words) Thesis. Degree honor, council quality rules low become justice

development court and labor relations conciliation mediation,

Engineering electrical trade research policy skill ,safety security

order develop ,defense order

1 .1.1 *Thesis:

* Research policy

trade theory minimum : legislation skill development :

*1.1.2Education technology,: Education engineering relate low

manufacture ..

Degree honorable ; college low labor justice ,

* Low relate literature traditional African LTA practical low rules

African

Convert unite international relate low rules European American curent in

unity language culture African rules

Please provide details of the customer discovery training relied upon to meet the eligibility

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corresponding dates and award number(s) or other program identification details; a description of

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development court and labor relations conciliation mediation,

Engineering electrical trade research policy skill ,safety security

order develop ,defense order

1 .1.1 *Thesis:

* Research policy

trade theory minimum : legislation skill development :

honorable member certificate transcript outcome award

*overview : journal

* Key :

* Background:

*1.1.2Education technology,: Education engineering relate low

manufacture ..

Degree honorable ; college low labor justice ,

* Low relate literature traditional African LTA practical low rules

African

Convert unite international relate low rules European American curent in

unity language culture African rules

Low EIC, rules cebec rules ,UNESCO rules culture American culture NPA

,, accountability cultural science mathematics,Conte law USA ,UK

Australia ,national rules RSA sabs sans rules .

*College and university low Engineering rules :

Registration of low rules low congre low rules master cpd continue

developing skill master degree ,diploma continue topics rules ,unity

translate in African traditional mathematics usuel and Scotland UK land

UK and African land low rules integration reintegration accountability

research recharge system education technologie education technical

career and vocational career trade training trainer facilitator

moderator low assessor

Please check the appropriate box below to indicate whether the proposing Fast-Track team will

be complete at the time of proposal submission. Yes

10. Is this Project Pitch for a technology or project concept that was previously submitted as a full

proposal by your company to the NSF SBIR/STTR Phase I Program – and was not awarded ?

Yes

Please provide the Proposal Number of the previously submitted full NSF SBIR/STTR Phase I

proposal ?

1234568

Have you contacted the associated NSF SBIR/STTR Program Officer, via email or phone, to

discuss this prior full proposal submission? 1..1 introduction : framework experimental nated ncv combination

Nated combination irregularity policy management system information

workbase experimental facilities moderator p

*1.3.2..3 Overview career libraries ,mentor facilitator library research

method book .

Low congre library,

*1.3.2..3.

3.1Key: about library research centre the mission of the low library of

congress is to provide authoritative legal research , reference and

instructions service and access to an resolved.

Established 1832 low library has a collection of over ,2,9 million

volumes spanning all systems and period of low and government all the .

* The library of congress provides congress admnister the national

copyright system and manage the largest collection of book recording ,

photography maps ,16 years authority record .

* Administration commercial ,low environment criminals low procedure

intelligence , property legal , .

* Broken down research court record .

* Grant proposal : non profit grant proposal date submission grant

submitted to asresss

_____

1.3.2..3.4.request for proposal :

4.1* education technology ,and master engineering electrical a,

Education Technical career Engineering .

*REP. |. Proposal | compagny

- 4.2 .project overview :

- 4.3 .project goals :

-4.4.scope of work :

-4.5 .current roadblocks and bariere.

- 4.6.evaluation metric and .

-4.7. submission requirements.

- project due |. Date. | Budget amount

-Contact : email.

_____

1.3.2..3..1.*Overview: national skill fund ,,and national research

fund. Career proposal

-1.2*dealine : local Engineering study in workplace jhb RSA. PretoriaMidrand. To

UK and USA ,10 December 2024.

-1.3* time frame : 5 years ,,to 2 years

- 1.4*limitations : principal career proposal career compte.

-1.5* submission by : Aiu research and. ,dhet saqa.

-1.6* instruction : pdf proposal and award policy (

PAPPGG),NSF..,,proposal certificate congre archive internet library

Award compagny. Aware ,,saqa aware ,dhet aware ,college aware.

-1.7.* minimum budget : 40000.0000 total program officer budge except.

Google budge apple

- 1.8* eligibility:

* Requirements : as of application ,hold degree field engineer trainee,

provide award type .

- preparatoration :

1.10.Review faculty early development:. allocation note:.

_____

- |documents| require|requirements|NSf

-cover projet | yes | begin withcareer|N/a

-project summary| y|following | N/a

-project descript| y |. | N/a

-result from | yes |.

-budget and|

- facilitator.|

-senior person|

- bibliography.|

Card board

- supplemtaire.

- past doctoral.

- research.

_____

1.3.2..3.1.11. project description : .

1.11.1 proposal sect research :

1.11.2. rational :

1.11.3. preliminary :

1.11.4 .data appropriate :

1.11.5.literaire where appropriate :

1.11.6. hypothesis overall :

1.11.7. questions research :

1.11.8 .description propose education activity integration:

1.11.9. description team and experience and expertise argument lock.

1.11.10. research / Education relevant for your career trajectory goal..

1.11.11 . limitations : conting plans .

1.11.12 . Expected outcome .

1.11.13. Definition of project of scussful .

1.11.14 distribution / delivery time research .1.11.14. measure planned or possibility resulted ...

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11. Has your company received a prior NSF SBIR or STTR award?

No

12. Does your company currently have a full Phase I SBIR or STTR proposal under review at

NSF?

Yes

13. Briefly Describe the Technology Innovation?

evel disciplinary

1.2 .problem statement :

Implementating framework qualicafition system agreement statement over

stay system education technologie and technical vocational engineering

field in Engineering lecture and assessor conducted learner need to

print in time outcome information and quickly statement ..of review

marked and remarking

- purpose of study : research advanced field and research basic

essential field system rurale need to implementating in new

system.

Energy of education technology era system council adoption low rules

statement college distance learning courses subject issue teacher

design framework and work framework with learner job. Team ..

1.3 .2 rational : idea logic approach methodic disciplinary hearing

duty system of institution vocational and system management system

information need resolved , idee job fractinel evidence low design

information management system instituts police no meeting equivalent

national exam and statement of result research out mark druip reason

additional information irregularity system need to make reason quotion

of job learner lecture agreement of same compensation insurance for

aware certificate compliance hr resource to recognise certain factor

idee no to monopolies education system but democratic liberalism of

certain factor in examination criterial of course private system

industrial..

-1.5 background to the study :

Ireviewed and over view system agreement continue framework attandance

rurale school college time table more less agreement system policy

academic organisation of national trade faculty and national framework

qualicafition system internal working base system need to

quickly factor

policy dhet cat council award challenge policy college academic with

engineering system theory and combination factor need theory to be

agreed with internal14. Briefly Describe the Technical Objectives and Challenges?power Systems and Renewable Energy

Optimization of Microgrid Systems

oInvestigating AI-driven optimization for hybrid renewable microgrids.

oCase study on cost-benefit analysis of microgrids in remote areas.

Smart Grid and Energy Storage Technologies

oEnhancing demand response strategies using machine learning.

oOptimization of battery energy storage for grid stabilization.

Wireless Power Transmission

oDeveloping high-efficiency resonant inductive coupling systems.

oApplications of wireless power transfer in electric vehicles.

2. Control Systems and Automation

AI-Based Predictive Maintenance in Industrial Systems

oMachine learning for fault detection in power transformers.

oPredicting failures in rotating machinery using deep learning.

Advanced Robotics and Control Algorithms

oAdaptive control for autonomous robotic arms.

oPath optimization algorithms for multi-agent robotic systems.

IoT-Based Smart Home Automation

oImplementing AI-driven smart home systems for energy efficiency.

oSecure communication protocols for IoT-based automation.

3. Embedded Systems and Internet of Things (IoT)

Edge Computing for IoT Devices

oImplementing real-time AI inference in low-power embedded systems.

oOptimization of edge computing frameworks for industrial IoT.

Wearable Health Monitoring Devices

oDeveloping ECG monitoring using flexible sensors and AI analysis.

Low-power IoT solutions for real-time health monitoringomakers to create

a robust, effective vocational education system

: Framework for Vocational Education with a Focus on NATED and NCV

Integration in South African Colleges

This topic can explore the integration and implementation of frameworks

for vocational education, particularly the National Diploma (NATED) and

National Certificate (NCV) qualifications within South African colleges.

The research would focus on how these systems can be effectively

combined to address challenges in vocational education, experimental

facilities, policy irregularities, and workplace-based learning.

Introduction to the Framework for Vocational Education

Overview of NATED and NCV

oThe National Diploma (NATED) and National Certificate (NCV) are the two

key qualifications within South African vocational education, designed

to enhance the employability of students.

oThe NATED qualification offers a more academic-based approach, while

the NCV focuses on practical skills training aligned with specific

trades.

Objective of Combining NATED and NCVoObjective: Explore how combining the NATED (academic) and NCV

(practical) systems can provide a more comprehensive, holistic

vocational education model.

oGoal: Enhance industry readiness and workplace skills by addressing

policy inconsistencies, improving management systems, and ensuring

strong work-based learning components

. Experimental Framework and Integration

Experimental Approach:

oIntroduce experimental frameworks to ensure both theoretical knowledge

and practical skills are addressed.

oImplement real-world case studies, hands-on training, and industry

feedback mechanisms to ensure the combination of theoretical and

practical education is balanced.

Curriculum Structure:

oDesign curriculum modules that address both theoretical coursework

(NATED) and practical skills (NCV).

oProvide a blended learning approach that mixes online learning,

classroom lectures, and workplace training.

15. Briefly Describe the Market Opportunity?

Project Description (Research Proposal Structure)Project Description

(Research Proposal Structure)

1.1 Proposal Section Research

Objective: This section should outline the primary aim of your research.

It should highlight the problem you aim to solve or the gap in knowledge

that your research will address.

oExample: "This research will explore the integration of machine

learning in electrical power systems to improve efficiency in load

shedding management."

1.2 Rationale

Why this research is important: Justify why the research is valuable,

its social, economic, or scientific impact. Provide insight into the

relevance of the study in your field.

oExample: "The study will provide solutions to the critical issue of

power supply reliability in developing countries, where load shedding

impacts industrial productivity."

1.3 Preliminary Research

Literature Review: Highlight key findings from previous studies in your

field. This shows what existing research is available and where your

work fits within it.

oMention gaps, contradictions, or opportunities that your research will

address.

16. Briefly Describe the Company and Team?1.8 Proposed Educational

Activity Integration

How this research integrates with education: Discuss how this project

can be used in educational settings, either through curriculum

development, workshops, or by providing a learning opportunity for

students.

oExample: "This research will integrate a training module for

engineering students to learn about AI applications in power systems,

preparing them for the evolving energy sector."

1.9 Team Description and Expertise

Research Team: Outline the qualifications, experience, and expertise of

the people working on the project.

oExample: "The team will consist of Prof. X, an expert in machine

learning, and Dr. Y, an electrical engineer specializing in power

systems optimization."

1.10 Research/Education Relevance for Career Trajectory

Link to Career Goals: Explain how this research fits into your personal

career aspirations. Highlight how it will improve your expertise and

future opportunities.

oExample: "This project will enhance my career by providing cutting-edge

expertise in both electrical engineering and AI-driven solutions,

positioning me as a leader in smart grid technologies."

1.11 Limitations: Contingency Plans

What limitations exist in your study and how you plan to

address them.

This could be data access issues, technological barriers, or budget

constraints.

oExample: "A limitation of the study is the potential lack of data

availability for certain regions. In case this occurs, we will

collaborate with local utilities to gather primary data."

1.12 Expected Outcome

What you hope to achieve: Outline the expected results and the impact

these could have in your field.

oExample: "W

17. How did you first hear about our program?

University tech transfer, VPR, or other administrative office

NSF SBIR/STTR Phase I Eligibility Information:

In addition to receiving an invitation to submit a full proposal from the NSF SBIR/STTR Phase I

Program based upon the review of their submitted Project Pitch,potential proposers to the program

must also qualify as a small business concern to participate in the program (see SBIR/STTR

Eligibility Guidefor more information).

The firm must be in compliance with the SBIR/STTR Policy Directive(s) and the Code of Federal

Regulations (13 CFR 121).• Your company must be a small business (fewer than 500 employees) located in the United

States. Please note that the size limit of 500 employees includes affiliates.

• At least 50% of your company's equity must be owned by U.S. citizens or permanent residents,

and all funded work needs to take place in the United States (including work done by consultants

and contractors).

• Primary employment is defined as at least 51 percent employed by the small business. NSF

normally considers a full-time work week to be 40 hours and considers employment elsewhere

of greater than 19.6 hours per week to be in conflict with this requirement.

• The Principal Investigator needs to commit to at least one month (173 hours) of effort to the

funded project, per six months of project duration.

For more detailed information, please refer to the SBIR/STTR Eligibility Guide by using

https://www.sbir.gov/sites/default/files/elig_size_compliance_guide.pdf. Please note that these

requirements need to be satisfied at the time an SBIR/STT

Dear tshingombe,

Here is the copy of the Project Pitch with reference number : **00095759** submitted to the

Advanced Manufacturing (M) on **12/18/2024**.

1. Submitter Email

tshingombefiston@gmail.com

2. Submitter First Name

tshingombe

3. Submitter Last Name

tshitadi

4. Submitter Phone Number

0725298946

5. Company Name

Engineering electrical tshingombe

6. Company Zip Code

10300

7. Company State

AK

8. Company Website

htpps//:www.tshingimbefiston.com

9. SBIR/STTR topic that best fits your projects technology area

Advanced Manufacturing (M)

Are you eligible and interested in being considered for the NSF Fast-Track program?

Yes

Please provide details of the NSF research funding relied upon to meet the eligibility

requirements, including: NSF research award number(s); the proposing company personnel

involved in each of the listed research awards and their roles in the research awards; and a brief

explanation of how the cited research funding relates to the proposed Fast-Track project. (up to

150 words)

Engineering electrical master skill ,manufacture

Please provide details of the customer discovery training relied upon to meet the eligibility

conditions, including: a description of the customer discovery training program(s), with

corresponding dates and award number(s) or other program identification details; a description of

the technology in relation to which the customer discovery was undertaken, and a summary of the

customer discovery findings. (Up to 250 words) Engineering electrical manucture electrotech

Please check the appropriate box below to indicate whether the proposing Fast-Track team will

be complete at the time of proposal submission.

Yes

10. Is this Project Pitch for a technology or project concept that was previously submitted as a full

proposal by your company to the NSF SBIR/STTR Phase I Program – and was not awarded ?

Yes

Please provide the Proposal Number of the previously submitted full NSF SBIR/STTR Phase I

proposal ?

1234567

Have you contacted the associated NSF SBIR/STTR Program Officer, via email or phone, to

discuss this prior full proposal submission?

Engineering electrical

11. Has your company received a prior NSF SBIR or STTR award?

Yes

Please provide the Proposal Number of the previously submitted full NSF SBIR/STTR Phase I

proposal ?

1234567

12. Does your company currently have a full Phase I SBIR or STTR proposal under review at

NSF?

Yes

13. Briefly Describe the Technology Innovation?engineering electrical-Proposal of thesis content / final project

Content

1 .name of thesis

2.index

3. Introduction.

4.description .

5.general.analizing

6.current information .

7.discussion

8 conclusion.

9. Bibliography.

_____

1.Name of thesis : implementation and framework national qualification

and national trade examination circulum experimental job theoretical

pratical college and government policy LMS in engineering studies

science electrical businesses module: case studies rsa in dhet,saqa ,

St peace college

2. Index: topic achieve research advance field basic field , essential

filling research circulum, fundation intermediate,elementaire

3.Introduction : the core and research advanced field experience of

sciences engineering electrical study and implement programme in social

education and industrial trade vocational career productu sector in

energy electrical and science engineering field system need to learn and

re implement system information management system sector opportunity

and through activities investment horizontal creation of equitable

distribution: transformer science engineering and electrical product

method learn capacity generative intelligence systems of linear

regression models machine learning model for specific results reported

that they haveA Mon other aspirations Isreal parameter real power factor

and Imagineer power factor ,, need to resolved system exper and

artificial intelligence system rural development system residential

dispatch deployment system and framework qualification mean regulation

humain resource and material work trade design career center to make

system LMS factor adaptation between robot science trade elementary work

trainer training phase products and systems industrial generator

entrepreneurs in same order phase assessment news field and

compensation.problem ask rural development need new training order

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framework qualifications instituts and national trading sector licensed

theory and practical in nature and creative abilities,

-typical evry country or landscape will be in a constant state of design

system in ,,,,

Large measure unpredictable and this city or village at different paint

of time ,, implementation the Grove years of failed turound ..

4.desceiption :at the heart of solutions to framework qualicafition and

national trade implementation sub sector training trainer experiementalwork place industrial more student and instituts college trade years

external internal work value increase price macro economics instability

Crete ,.sice accentuated by advertising shortage high inflation levek

rising unemployment capacity industrial trademarks society

system and

materials adequately support trade training QMS system information

commissioner,to under utilities in the address desterious policy design

implementation ,

5. General analysis: in order to break the successful it has become

social contract principle in

14. Briefly Describe the Technical Objectives and Challenges?Engineering-6 current information:

In working to formatted a trade framework qualic

For the turnaround ,the following

- objective.

- the diagnosis the fundamental strategies instituts framework

qualicafition national equivalent national trade international sector

approval occupation council trade council engineering sector portal

career design to synchronise system adaptative sector LMS learner

engineering competition grade post senior principal, engineering

electrical ,tradesman wire ,cadet minim system up date successful system

in design grade operational, framework award qualifition research

undertake material test week conductor atom technical engineering

innovation learn teach research mark method marks need to implement

adaptative system , research topics circulum regulation irregularity

material script, backlog system , combination system ,printer

and system

need to make synchronise system deploy generative job framework

undercover job in next generation must going

- to discern and isolate the sicio economic environment engineering

system trade safety security police , commissioner trade need to meet

requirements qualicafition framework and the framework must also show in

the social successful but framework it increases by outage loadshedding

and social down to declined empirical experiemental in other

contemporary ,the regret filled job no successful for time table printer

system or computers system experiemental make design advanced research ,

-7. discussion the objective is to explore that strategies and situation

where Rapide performance import. Trade theory..

- conclusion:

Whilst the field of strategy has be explored extensively in vast to

trade framework qualifications need to requalification system was

temporarily qualify expire system in job work sector training and

regulations system industrial system need cpd to continue system and

subject short and gate more skill job was slow operational field basic

in basic was poorly no attandance system advance essential field job

make support frame commissioner no meeting system trade retrade was not

in the same ways Orders orientation industrial, imperative hard, largely

,the research interest and how a fruit full common,ground can be

established.

- one of the critical virtues of the proposal thesis that it

Engineering electrical science make in order to stabilize thought

transfer the vei ld consensus building in ,,- the thesis is ,, model design

Policy commissioner vs learn vs teacher vs ,, framework national trade

vs company property intellectuel business electrical system need to

meeting...wrong model design topic ,, research rural energy design

framework , and orientation system learner teach career mentor

faciltor purpose framework,leaver school need to meeting,

Design two g city design systeme economic revenue bank system portal

need sector trade to work in place electrical designer b Poste trade

case research job workplace resulted was recruited need printer pool

position rank no waiting

- 8 bibliography:

- tshingombe 2023_2924 < Poe's published,,educ technology, magazine net

database, St peace college.

Record book completed

- web TVET dhet ,saqa wab

- alu

_____

Graduation procedure form . congratulations programme , diploma .

-1 data verification.

- grade | description| point | numeracy

15. Briefly Describe the Market Opportunity?

engineering electrical

16. Briefly Describe the Company and Team?

Engineering electrical master

17. How did you first hear about our program?

NSF email, webinar, or event

NSF SBIR/STTR Phase I Eligibility Information:

In addition to receiving an invitation to submit a full proposal from the NSF SBIR/STTR Phase I

Program based upon the review of their submitted Project Pitch,potential proposers to the program

must also qualify as a small business concern to participate in the program (see SBIR/STTR

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States. Please note that the size limit of 500 employees includes affiliates.

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normally considers a full-time work week to be 40 hours and considers employment elsewhere

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funded project, per six months of project duration.

For more detailed information, please refer to the SBIR/STTR Eligibility Guide by using

https://www.sbir.gov/sites/default/files/elig_size_compliance_guide.pdf. Please note that these

requirements need to be satisfied at the time an SBIR/STTR award is made, and not necessarily

when the proposal is submit

I-Corps Executive Summary ID :

P-09874

Academic Institution :

Engineering electrical tshingombe

Entrepreneurial Lead :

tshingombe tshitadi

Entrepreneurial Lead Email :

Email tshingombefiston@gmail.com

Entrepreneurial Lead Qualification :

Engineering electrical

Technical Lead :

tshingombe tshitadi

Technical Lead Email :

Email tshingombefiston@gmail.com

Technical Lead Qualification :

Information technology

I-Corps Mentor :

tshingombe tshitadi

I-Corps Mentor Email :

On Tue, Feb 25, 2025 at 10:31 AM tshingombe fiston <tshingombefiston@gmail.com> wrote:

Thank you for submitting your company's Project Pitch to America's Seed Fund powered by the National Science Foundation - the NSF's Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Program. One of our program directors will review your submission and send you feedback via email within approximately one month.

For you reference, your Project Pitch submission number is **00098889** and was submitted to the **Energy Technologies (EN)** SBIR/STTR topic area. Please be aware that your Project Pitch may be re-assigned and reviewed under a different topic area if determined to be better aligned with that topic.

Please make sure to check your inbox and spam folder frequently. You may also view and revise your submitted Project Pitch at https://nsfiip.force.com/mywork/s/my-pitch-submissions Please note that this link will only be available until your Project Pitch enters the review process.

Please visit our program website for more information about the Project Pitch process, review criteria, current SBIR/STTR Phase I solicitations, and upcoming informational webinars.

Please also note:

- If the proposed project is determined to be a good fit for the program's objectives of supporting innovative technologies that show promise of commercial and/or societal impact and involve a level of technical risk, the small business representative who submitted the Project Pitch will receive an invitation via email from the cognizant NSF SBIR/STTR Program Director or staff member responsible for reviewing your Project Pitch to submit a full proposal.
- If the proposed project is determined to be not responsive to the SBIR/STTR Program solicitation (please refer to the "Objectives Not Responsive to the Solicitation" section of the SBIR/STTR solicitation document), the potential proposer will receive a notice stating that the small business is not invited to submit a proposal.
- Project Pitches that are not invited for a full proposal may be resubmitted (with revisions to address any deficiencies) in the next submission window.
- Any small business with a pending Project Pitch must wait for a response before submitting another Project Pitch.
- Any small business that has received an invitation to submit a full proposal must wait for a resolution of the full proposal before submitting a new (or revised) Project Pitch.
- A given small business is permitted to submit one Project Pitch per submission window (please refer to submission window dates listed at the beginning of the solicitation document). Having an invitation to submit a full proposal, or a full proposal under review, prohibits the submission of a new Project Pitch by a given small business, even in a subsequent submission window.

Should you not receive a response from NSF within approximately one month, please contact us at *sbir@nsf.gov*. Please include your Project Pitch submission number in the subject line of any correspondence.

Survey Overview

The National Science Foundation's (NSF) Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) proposal submission process recently changed. We would like to hear from you about this pilot process, which was created to reduce the burden on small businesses and NSF program staff.

The newly added Project Pitch requires a small business to outline the **technical innovation**, **commercialization potential**, and **broader impact** of their project before submitting a full proposal to NSF. Only projects that are determined to be a good fit for the program's objectives of supporting innovative technologies that show promise of commercial and/or societal impact and involve a level of technical risk (mentioned above and outlined on our website: https://seedfund.nsf.gov/) will be invited to submit a full proposal, therefore reducing the time and effort spent by small businesses in order to receive initial feedback on their potential fit with the program requirements. To gauge the effectiveness and clarity of this new process, we would appreciate your feedback.

Please note:

1. Your participation is voluntary.
2. Your individual responses will remain confidential and will be compiled with those from other respondents to improve the NSF's program.
3. Your answers will NOT affect the outcome of any current, pending, or future NSF funding requests.

This section asks about your familiarity with the program as well as your level of experience in applying to the program.

Question Title

** 1-1. Has your small business submitted a full proposal to the NSF SBIR/STTR Program before?*

- ○ Yes
- ○ No

1-2. If Yes, how many full proposals has your small business previously submitted to the NSF SBIR/STTR Program?

SBIR/STTR Satisfaction Survey for New Phase I Solicitation - Proposers

Familiarity with the NSF SBIR/STTR Program

Question Title

** 1-3. How did you first hear about the NSF SBIR/STTR Program? [Mark all that apply]*

- ☐ Conference
- ☐ Trade show
- ☐ Network (Professional or Personal)
- ☐ Consultant or Service Provider
- ☐ Angel Investor
- ☐ Venture Capitalist
- ☐ University Business Incubator or Accelerator
- ☐ State Economic Development Office
- ☐ Small Business Administration

- ☐ United States Patent and Trademark Office
- ☐ Grants.gov
- ☐ NSF.gov
- ☐ Social Media - Twitter, Facebook, LindkedIn
- ☐ Others (please specify)

Question Title

** 1-4. How did you first learn about the new Project Pitch requirement? [Select only one]*

- ☐ NSF Solicitation
- ☐ NSF SBIR/STTR website (https://seedfund.nsf.gov)
- ☐ The FAQs section of the NSF SBIR/STTR website
- ☐ Email/Phone call with NSF staff members
- ☐ Webinars
- ☐ Presentations from SBIR/STTR Program Directors
- ☐ Others (please specify)

Question Title

** 1-5. Out of all the sources, which is the most helpful to you in learning about the new step or in submitting a Project Pitch? [Select only one]*

- ☐ NSF Solicitation
- ☐ NSF SBIR/STTR website (https://seedfund.nsf.gov)
- ☐ The FAQs section of the NSF SBIR/STTR website

- [ ] Email/Phone call with NSF staff members
- [ ] Webinars
- [ ] Presentations from SBIR/STTR Program Directors
- [ ] Others (please specify)

50% of survey complete.

Powered by

Process Satisfaction

This section asks about the overall submission process and the length restrictions on the Project Pitch.

Question Title

** 2-1. How easy or difficult was it to submit your Project Pitch* via *the online form?*

- ○ Very difficult
- ○ Difficult
- ○ Neither difficult nor easy
- ○ Somewhat easy
- ○ Very easy

Question Title

** 2-2. Do you agree or disagree with the following statement?*

I understood what I was asked to submit in the Project Pitch.

- ○ Agree

- Neither agree nor disagree
- Disagree

Question Title

** 2-3. Approximately how long did you spend in preparing and submitting the Project Pitch?*

Time (minutes):

SBIR/STTR Satisfaction Survey for New Phase I Solicitation - Proposers

Process Satisfaction

Question Title

** 2-4. The Project Pitch was limited to approximately 3 pages. Did you think this limit was too long, too short, or about right?*

- Too long
- Too short
- About right

Question Title

** 2-5. The Technical Innovation section of the Project Pitch was limited to 500 words. Did you think this limit was too long, too short, or about right?*

- Too long
- Too short
- About right

Question Title

** 2-6. The Technical Risk section of the Project Pitch was limited to 500*

words. Did you think this limit was too long, too short, or about right?

- Too long
- Too short
- About right

Question Title

** 2-7. The Customer Profile and Pain Point(s) section of the Project Pitch was limited to 250 words. Did you think this limit was too long, too short, or about right?*

- Too long
- Too short
- About right

Question Title

** 2-8. The Background and Current Status section of the Project Pitch was limited to 250 words. Did you think this limit was too long, too short, or about right?*

- Too long
- Too short
- About right

75% of survey complete.

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See how easy it is to create surveys and forms.

This section asks about the technology area of your small business, and whether you have had any interaction with NSF SBIR/STTR Program Directors before submitting the Project Pitch.

Question Title

** 3-1. Which of the following best describes your research or technology areas? [Select one]*

Question Title

** 3-2. Did you have any interaction with the NSF SBIR/STTR Program Director(s) prior to submitting the Project Pitch?*

- Yes
- No

My Submissions

Navigation Mode

00098889 fiston tshingombe tshingombefiston@gmail.com 072529894

00097898	fiston tshingombe	tshingombefiston@gmail.com	0725298946
00095759	fiston tshingombe	tshingombefiston@gmail.com	0725298946

Executive Summaries below.

My Submissions

Navigation Mode

Sort

P-09948	Atlantic international university	fiston tshingombe	fiston t
P-09874	Engineering electrical tshingombe	fiston tshingombe	fisto

Thank You,

The NSF SBIR/STTR Team

****

We'd love to get your feedback on our pilot Project Pitch process! If you have a few minutes, please take our anonymous survey. The survey asks a few questions about your familiarity with our program and satisfaction with the process. Your responses will help us to improve the process, quality of our services, and user experience going forward. Thank you in advance for your time!

Article submission received

Inbox

e

editorial@f1000research.com 11:40 AM (4 minutes ago)

to me

Dear tshingombe

Thank you for submitting your manuscript:

Case Report: research and project master energy rural career experimental engineering electrical

job

tshitadi t

We will carry out a number of editorial checks on your article, including: that the article fits with F1000Research's scope; readability and manuscript format; adherence to ethical standards for the type of study; that the underlying data have been supplied (where appropriate); and that there is sufficient detail to enable others to replicate the study (if applicable).

We will be in touch as soon as possible with any issues that need addressing.

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Please quote the article number 164327 in any correspondence.

Kind regards

The Editorial Team, F1000 on behalf of F1000Research

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